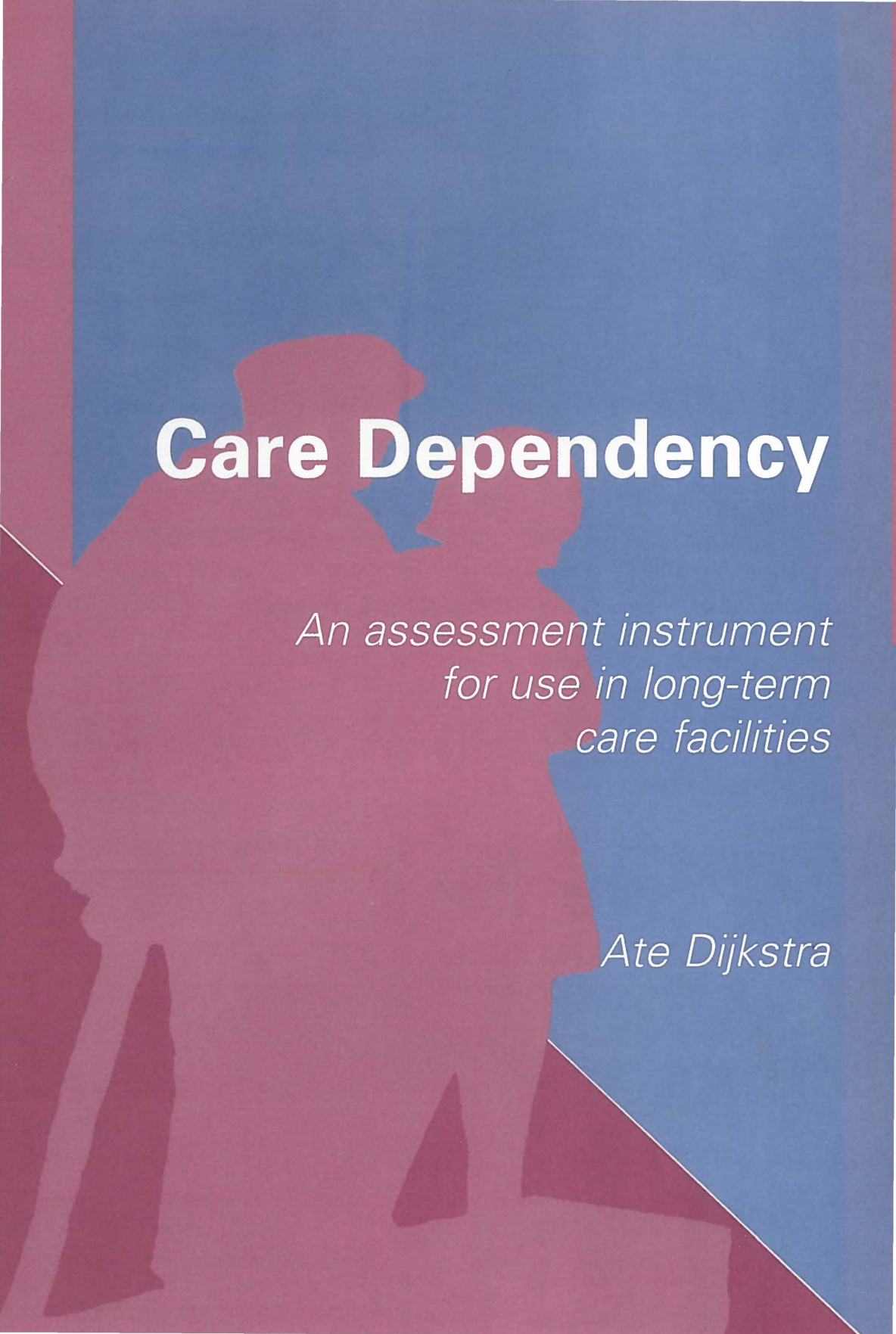

Care Dependency

An assessment instrument for use in long-term care facilities

Ate Dijkstra

CARE DEPENDENCY

An assessment instrument for use in long-term care facilities

Stellingen

Stellingen behorende bij het proefschrift 'Care Dependency;
An assessment instrument for use in long-term care facilities'
van Ate Dijkstra

1 De mens is noch zorgafhankelijk noch zorgonafhankelijk

2 De zorgverlener is door de Care Dependency Scale verkregen informatie beter in staat de interventies te kiezen, die aansluiten bij de zelfzorgmogelijkheden van de patiënt

3 Het verlies van sociale relaties en het verlies aan communicatieve vaardigheden dragen voor een belangrijk deel bij aan het voorspellen van de toekomstige zorgafhankelijkheid

4 De discussie of de verpleging in Nederland behoefte gestuurd dan wel diagnose gestuurd dient te zijn, houdt vanuit patiëntenperspectief een omkering van doel en middel in.

5 Patiënten zijn meer gediend met de vraag hoe verpleegkundigen aan de zorgvraag van de patiënt kunnen voldoen dan waarom ze het doen

6 De van overheidswege opgelegde regelgeving in de gezondheidszorg leidt steeds meer, zowel bij consument als werker, tot regelapathie en regelallergie

7 Het is wenselijk om daar waar in gezondheidszorginstellingen de namen van medisch specialisten genoemd worden die van de verpleegkundig specialisten toe te voegen

8 Interactie- en communicatieprocessen tussen patiënt en zorgverlener laten zich slecht protocolleren

9 Orgaandonatie vraagt om een heldere definiëring van de begrippen leven, sterven en dood

10 De huidige financieringssystematiek van de gezondheidszorg is onvoldoende flexibel om transmurale zorg te realiseren

11 Fusies tussen zorginstellingen binnen Europa zijn een kwestie van tijd

Independence

It is fortunate
to be favoured
with praise and popularity.
It is dire luck
to be dependent
on the feelings of a fellowman.

In: Björn Jónasson. (1992). The Sayings of the Vikings, Gudrun publishing, Reykjavík.

Rijksuniversiteit Groningen

CARE DEPENDENCY

An assessment instrument for use in long-term care facilities

Proefschrift

ter verkrijging van het doctoraat in de
Medische Wetenschappen
aan de Rijksuniversiteit Groningen
op gezag van de
Rector Magnificus, dr. D.F.J. Bosscher
in het openbaar te verdedigen op
woensdag, 30 september 1998
om 15.00 uur

door

ATE DIJKSTRA
geboren op 2 februari 1950
te Leeuwarden

Promotores

Prof. Dr. W.J.A. van den Heuvel

Prof. Dr. Th.W.N. Dassen

Promotiecommissie

Prof. Dr. C.M.A. Frederiks

Prof. Dr. D. Post

Prof. Dr. D.H. Sipsma

1998
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Voorwoord

It giet oan, de tocht naar de oude Friese academiestad Franeker kan gemaakt worden. Dat het ooit zover gekomen is, is aan velen te danken.

Allereerst wil ik Dick Sipsma noemen, zijn enthousiasme, adviezen en de gegeven ruimte om de (psycho)geriatrische praktijk wetenschappelijk te onderzoeken heeft een stimulerend en bevorderend effect op het verloop van de studie gehad. Verder was dit proefschrift niet geschreven zonder de directe betrokkenheid van Theo Dassen en Girbe Buist. De ontmoeting met Theo Dassen op een refereeravond van de Groninger sectie Verplegingswetenschap is aanleiding geweest om het idee 'onderzoek te doen op het terrein van de verpleegkunde en de geriatrie' te concretiseren. Ten aanzien van het gekozen onderwerp ben ik zeer veel dank verschuldigd aan Girbe Buist. Uit eerder door hem uitgevoerd onderzoek bleek Virginia Hendersons model van fundamentele menselijke behoeften een uitstekend hulpmiddel te zijn om verstandelijk gehandicapten in groepen naar afhankelijkheid te classificeren. Op basis van dit onderzoeksresultaat werd besloten Virginia Herdersons 'basic needs' model als uitgangspunt te nemen voor het ontwikkelen van een instrument waarmee de mate waarin een patiënt afhankelijkheid is van verpleegkundige zorg vast te stellen.

Ook anderen wil ik bedanken voor hun bijdrage aan de totstandkoming van dit proefschrift. Zo hebben zeer veel verzorgenden en verplegenden uit verschillende verpleeghuizen en uit de verstandelijke gehandicaptenzorg in de afgelopen jaren hun bijdrage geleverd aan het onderzoek door het invullen van één of meerdere vragenlijsten. Daarbij denk ik met name aan degenen werkzaam in het, voor mij zo vertrouwde, psychogeriatrisch verpleeghuis Nieuw Toutenburg te Noordbergum. Wim van den Heuvel is, als promotor, nauw betrokken geweest bij het transformeren van het onderzoek naar het voor een promotie noodzakelijk wetenschappelijk niveau.

Zijn inspiratie en adviezen zijn voor mij zeer belangrijk geweest, daarnaast is de internationalisering van het onderzoek grotendeels op zijn conto te schrijven.
Theo Dassen, eerst als begeleider en nu - na zijn aanstelling als hoogleraar Verplegingswetenschap aan de Humboldt Universiteit te Berlijn - als promotor, was altijd bereid tijd vrij te maken om de aangeleverde teksten te beoordelen. Zijn opmerkingen en methodologische adviezen zijn voor mij zeer waardevol geweest.
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The international widening of this study created a possibility to cooperate with colleagues across various countries. I would like to thank Lauraine Brown and Betty Havens from Winnipeg, Canada; Tor Inge Romoren from Stavern, Marit Henny Kjoeglum and Grethe Boegh Naess from Namsos, Norway; Renzo Zanotti from Padova, Italy; and, recently, Gerd Bansemir from Berlin, Germany; Liisa Palo-Bengtsson from Huddinge, Sweden; and June Clark and Mick Coleman from Swansea; United Kingdom. Thank you all very much for your contribution in the success of this study.

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Mijn allergrootste dank gaat echter uit naar Pieta, Ellen, Sietse en Ate jr. Zonder hun permanente steun was het onbegonnen werk geweest. Hun meestal stilzwijgende goedkeuring maakte het mogelijk mij 'steeds even' te onttrekken aan huiselijke en sociale plichten. Ik hoop dat daar nu een einde aan is gekomen.
Franeker, voor ons gezin geen onbekende stad. Zeven jaar hebben we er gewoond en gewerkt. De keuze van de stad om dit proefschrift in het openbaar te verdedigen was dan ook snel gemaakt: Franeker, 'een stad om terug te komen'.

Contents

[1] In the course of the research project the name of the instrument underwent a change: Nursing Care Dependency scale (NCD), as used in the chapters 1 to 6, became Care Dependency Scale (CDS) in the chapters 8 to 12.

1 Introduction

Ate Dijkstra

Rationale

Life in long-term care facilities, such as nursing homes and institutions for the mentally handicapped, is characterized by the high degree of dependency of patients[2] on those taking care of them. The high degree of dependency is caused by the disabilities of the patient as well as by the control function of these institutions.
This is the reason why both the Dutch government and the umbrella organizations for the care, i.e. the Netherlands Association for the Care of the Disabled (in Dutch: de Nederlandse Vereniging voor Geestelijke Gezondheidszorg (NVGz)) and the Netherlands Association for Nursing Home Care (in Dutch: de Nederlandse Vereniging voor Verpleeghuiszorg (NVVz)), have initiated a policy which aims at keeping patients self-supporting as long as possible and at limiting their dependency on others.
Care concepts of long-term care facilities should focus on decreasing the weight of the patient's disease, on improving quality of life, and maintaining social participation and independency (Ministerie VWS, 1995). These reference points for policy require a different approach to care. The focus of attention should no longer be on care supply, but on the patient's care demands. The care-to-standard (in Dutch: zorg-op-maat) concept suits this approach perfectly, and should therefore determine the attitude and mentality of the carers (see Figure 1).
They must pay a great deal of attention to a well-considered use of the patient's capabilities.

[2] In long-term care settings various words refer to a person admitted in a psychogeriatric nursing home or in an institution for the mentally handicapped. Right or wrong, frequently used words are "resident" (Wimmers, 1976), "patient", "aged person" or "mentally disturbed person". Throughout this thesis the word "patient" will be used.

On the basis of this new care concept, the aforementioned organizations have taken the initiative to formulate a new definition of quality care in their fields. In the nursing-home concept, which is the core of the nursing-home quality product, care-to-standard leaves scope for patients to make choices of their own and to strive for the largest possible independence (NVVz, 1992). The care concept for mentally handicapped persons also starts from the care-to-standard principle. Its core is a strong focus on the individual and their care demands. Great importance is attached to the independence of the mentally handicapped and their opinions and wishes (NVGz & Fiad-Wdt, 1992; NVGz, 1994).

Figure 1 The care-to-standard concept.

'Care-to-standard' represents an important and, in the Dutch health care system, comprehensively defined view of care supply. This view is characterized by putting the patient's care demands first. These care demands are examined extensively, irrespective of the care supply available. Through careful need assessment, a diagnosis is made of how this specific person with these specific needs could be supported the best. Not until the diagnosis has been completed, it will be decided which care facility fits the needs. It sometimes appears that various kinds of care are needed, or that a completely new kind of care supply would be the most adequate. Thus the pivotal point of the care-to-standard concept is that individual needs determine which kind of care should be given.
Source: Vreeke *et al.*, 1993.

In response to the works of Goffmann (1961), Szasz (1961), and Freidson (1970), who criticized institutionalization and professional dominance, professional workers in nursing homes and institutions for the mentally handicapped have taken many initiatives to maintain, monitor and improve the quality of care (NVGz, 1993; NVVz, 1993). In the last few years thinking about quality care in these care sectors has also been stimulated by the Quality of Care Institutions Act (in Dutch: Kwaliteitswet Zorginstellingen).
This law provides rules for the presence and functioning of an internal quality policy in institutions (Ministerie WVC, 1991).

In the minister's explanatory memorandum, the quality of care in institutions is measured by the way in which they shape the care process (Ministerie WVC, 1994).

In shaping the care process in nursing homes and institutions for the mentally handicapped, the specific character of this care must not be ignored. As distinct from those health care sectors where cure is central, the emphasis in nursing homes and institutions for the mentally handicapped is on care. According to Casparie (1991), this relative emphasis on care instead of cure is characteristic for the care of the chronically ill. The line between care and cure has often been the theoretical boundary line between nursing and medicine (Stevens Barnum, 1990). Institutional care has always been the domain of nurses[3], who to a large extent determine the way in which it is shaped into quality care (Buist, 1996). According to Boeije (1994), nurses regard quality care as synonymous to 'good care', and they think good care is prevalent when they take their patient's well-being as a starting-point for their actions and gear the care to the patient's needs and wishes. In what Henderson (1985, 1987) calls the only service available on a 24-hour and 7-day-a-week basis, the essence of nursing activities is to sense what help patients want and need to perform their daily activities, their physical and psychosocial functions included. To help nurses care for these wants and needs, a written care plan for each individual patient would be most advisable. In Dutch long-term care facilities, therefore, the so-called nursing process, including a care plan for each patient, has been introduced (Dijkstra, 1990; Barnhard & Meerveld, 1992). Yura and Walsh (1983) define the nursing process as an orderly and systematic matter of determining problems relating to health status, making plans to solve them, initiating and implementing the plans, and evaluating the extent to which the plans were effective in resolving the problems identified. The nursing process offers an opportunity to accomplish individual care in order to guarantee quality of care. In going over the steps of the nursing process to plan individual care, the demand for care and the contributions of the patient and the nurse can be determined.

[3] For reasons of legibility, the word 'nurse' will be used for nursing staff, both male and female, in nursing homes and institutions for the mentally handicapped.

In assessing the patient's need for care, a nurse seeks answers to the following questions: what is the patient's care demand, and does the patient need assistance in order to meet this demand?
From these answers a design and plan of care can be developed to help the patient move towards responsible self-care, which can take on the form of steadily increasing independency in self-care actions (Orem, 1985; Orem, 1995). In this way patients use the opportunities they have to satisfy their needs.

Research Objectives

Against the background of the rationale given for the research project, it is desirable to have a detailed knowledge of the patient's dependency. Detailed knowledge is necessary, because dependency is a complicated concept. For example, information is needed about the dimensions of dependency; the intensity of the impairments as a cause of dependency; the patient's potential for reversing dependency to maximum independency. Thus, what is dependency? How can it be measured by nurses and other health professionals? How reliable and valid are these measurements? What is the clinical significance of these measurements? Answers to these questions can help patients as well as (nursing) professionals to develop strategies for achieving maximal patient independency, and to optimize the role of the patient in self-care. Derived from the considerations presented above, the following research objectives were formulated.

1 Analyse and clarify the meaning of the concept 'dependency', in this thesis defined as 'nursing-care dependency', for use in the nursing practice of long-term care facilities.
2 Develop an instrument to assess the patient's dependency on nursing care in long-term care facilities and determine the psychometric properties of the instrument.
3 Investigate the clinical significance of the instrument.

The research objectives are elaborated in Chapters 2 to 9 inclusive of this thesis.

Overview

The study described in this thesis was part of a research project which started in the Netherlands at the end of 1994.
The study presents the results concerning the development and psychometric testing of an assessment instrument for use in long-term care facilities, especially psychogeriatric nursing homes and institutions for the mentally handicapped.
This project fits into the research program 'Disorder, Disability and Quality of Life' of the interfaculty research institute the Northern Centre for Health Care Research (NCH) of the University of Groningen. This theme comprises studies of the effects of functional, social and psychological factors on the course and recovery of daily functioning, and the quality of life of the chronically ill. Also, the development and validation of measurement instruments is characteristic of the NCH research program.
In Chapter 2 of this thesis, the meaning of dependency will be analysed and clarified in relation to nursing. Besides, a theoretical and operational definition of the concept of nursing-care dependency will be given. Further, a frame of reference will be selected which specifies observable indicators for measuring the concept given.
Chapter 3 describes in more detail the development and content validation of an instrument for assessing patient's care dependency.
In Chapters 4 to 6 inclusive, attention focuses on the main aspects of the instrument's psychometric properties: reliability, construct validity and criterion-related validity, both for the psychogeriatric nursing homes and for the institutions for the mentally handicapped.
From Chapter 7 on, the use of the scale in psychogeriatric nursing homes is researched. In 1996 an international widening of the Dutch research project took place. Researchers from Canada, Italy and Norway participated in the further development of the first product of the research project: a Dutch instrument to assess nursing-care dependency. In Chapter 7, in which the international psychometric testing of the assessment scale is evaluated, the combined data from four countries are used. NCD datasets from the Netherlands, Canada, Italy and Norway were analysed to answer the question referring to international comparability.
Chapter 8 reports on survival prognosis related to the severity of the patient's nursing-care dependency, and answers the question whether the nursing-care dependency status of a patient predicts survival.

Longitudinal results concerning the prediction of care-dependency among demented in-patients are discussed in Chapter 9. In Chapter 10 the work presented in this thesis is summarized, the research questions are discussed and conclusions are drawn. Finally, a Dutch summary of the present study is given in Chapter 11.
Except Chapter 1, 10, and 11, all chapters are adaptations of articles which were published or submitted for publication in several scientific journals. The disadvantage of such a procedure is that there is some overlap in information, particularly as to the methods and materials of the study. The advantage is that the chapters can be read separately.

2 Operationalization of the Concept 'Nursing-Care Dependency' for Use in Long-term Care Facilities

Ate Dijkstra, Girbe Buist, Theo Dassen

Abstract

Nursing-care dependency and similar terms are frequently used in nursing literature. However, their meanings are still to be adequately defined. This paper seeks to operationalize the concept of dependency for use in long-term nursing care practice. An analysis of the concept of dependency, specifically with regard to nursing care, will present a frame of reference from which a theoretical definition can be stated. Variables dimensions, observable indicators, and means for measuring the indicators are also presented. The paper concludes with implications for further research.

Introduction

Life in psychogeriatric nursing homes and institutions for the mentally handicapped can be characterized by the high degree of patients' dependency. Especially, many physical, cognitive and social disabilities of demented and mentally handicapped in-patients result in dependency on nurses. In the Netherlands nurses make use of assessment instruments which are based on psychological theories and therefore inadequate to assess the nursing dimensions of patient dependency. Therefore, a need was identified for nurses to assess patients' care dependency on the basis of nursing theory. Consequently, a research project was started at the Department of Nursing Science of the University of Groningen. The main aim of the project was to develop an assessment tool which could give a reliable and valid indication of patients' nursing-care dependency.

A phased programme was started to develop the scale and to test its psychometric properties.
The purpose of this initial study is to analyse and clarify the concept of nursing-care dependency. A threefold analysis will be presented. The first focus will be on the development of a general frame of reference for the basic element in the concept, i.e. dependency. The second area for consideration will be sufficient clarification of the concept of dependency to enable measurement. Third, the selection of a measurement framework will be considered.

Dependency

Dependency is a much used term in pedagogy, social psychology, psychiatry, medical science and nursing. It depends on the age group, they are dealing with whether these disciplines value dependency positively or negatively. For example, in the context of pedagogy and education Dewey (1966, p. 42) characterizes dependency as a power rather than a weakness: 'It sounds absurd to hear dependence spoken of as something positive, still more absurd as a power. Yet if helplessness were all there were in dependence, no development could ever take place'. When it concerns older people, or when diseases and/or handicaps appear, 'dependency always includes a negative evaluation of a situation or set of characteristics of an individual, defined as such by the individual and/or people in the person's environment' (Van den Heuvel, 1976, p. 162).
Therefore, a frame of reference needs to be developed to enable understanding of what it means to say that a person is dependent or care dependent and to differentiate between these terms. Pool (1995) distinguishes dependency from care dependency. Dependency is placed within the frame of common human relationships and care dependency is placed within the frame of professional and formal care assistance. George (1991) notices a tendency to conceptualize dependency as a single quantity which can be measured across all populations, regardless of situation, or as a personal attribute rooted in illness, impairment or old age. Van den Heuvel (1976) found the following meanings and descriptions of dependency.

Dependency may refer to:

1 A practical, almost physical helplessness which necessitates attention or care by others.
2 Helplessness or powerlessness in a social/personal relationship.
3 A psychological (physical) need to be looked after, controlled or nurtured.

Contrary to the idea that individual dependency arises primarily from a person's health condition, the main element in these meanings is that dependency implies a social relationship (Johnson, 1993). 'Deficit stands for the relationship between action that individuals should take and the action capabilities of individuals for self-care. Here deficit should be interpreted as a relationship, not as a human disorder' (Orem, 1985, p. 39). As George (1991, p. 178) states, 'one cannot simply be dependent; one must be dependent upon someone for something else'. According to Van den Heuvel (1976), dependency arises for two reasons. Either the individual defines his or her situation as dependent, or people in the person's environment define the person as dependent.

Therefore, the first element for a frame of reference is the definition of the situation by the individual, and the second is the reaction to that definition by people in the person's environment. Van den Heuvel (1976) adds the following two elements. Objectivity versus subjectivity as a result of a discrepancy in perception of the definition of the situation between the individual on the one hand and the environment on the other, is the third element. The fourth element is that either the individual or the environment or both evaluate the characteristics or situation of the individual as negative.

Operationalizing Nursing Concepts

Carper (1978) reminds nursing researchers of their responsibility to describe the concepts concerning nursing practice carefully and thoughtfully. Nursing concepts are thoughts, notions, or ideas about nursing or nursing practice, and define the content of interest in measuring nursing phenomena (Waltz, Strickland & Lenz, 1991). McCormack (1992) views concept analysis as a process used to determine similarities and differences between concepts, and to create a tentative operational definition.

According to Waltz *et al.* (1991), concept operationalization is delineating what a concept means and how it can be measured. Kim (1983) distinguishes conceptualization and concept analysis.
The former is an active generational process of theoretical thinking, whereas concept analysis is more reflective in nature and involves critical evaluation of conceptualization that has already occurred.
In this study, the process of operationalizing a concept has been influenced by the approach of Waltz *et al.* (1991).
They suggest a multistep procedure, representing progression from the abstract to the concrete. The procedure in this paper involves the following interrelated steps:

1 Developing the theoretical definition;
  [a] developing a preliminary definition
  [b] reviewing data sources in relevant literature
  [c] stating the theoretical definition
2 Specifying variable dimensions derived from the theoretical definition
3 Identifying observable indicators
4 Developing a means for measuring these indicators

Developing the Theoretical Definition

The preliminary definition

The preliminary definition will mainly be based on the work by Abdellah, Henderson and Orem. Such 'needs theorists' focus on problems and needs of patients as seen by health care providers and on the role of nurses in assessing these needs and meeting need requisites (Meleis, 1991).
Literature on Abdellah's, Henderson's and Orem's nursing theories reveals the following definitions and descriptions of synonyms which fit within the boundaries of the concept of nursing-care dependency.
For Abdellah, *nursing care* is doing something to or for the person or providing information to the person with the goal of meeting needs, increasing or restoring self-help ability, or alleviating an impairment (Marriner-Tomey, 1988).

Henderson (cited in Halloran, 1995, p. 89/90) views *nursing need* as whatever the person requires in knowledge, will or strength to perform his or her daily activities and to carry out treatments prescribed for him or her. And Henderson describes need for care as a self-help deficit (Halloran, 1995, p. 30).
For Orem (1985) a *care demand* exists when care abilities are less than those required for meeting a known self-care demand.
In Orem's view (1985), *nursing assistance* is a form of help given by nurses to persons with a legitimate need for it, by promoting self-care and motivating attempts toward independence.
Basing her description in Orem (1985), Meleis (1991) defines the term *self-care deficit* as the balance between self-care demands and self-care capabilities and an indication of a state of social independence.
In view of these findings, nursing-care dependency is preliminary defined as '*a nurse-patient relationship resulting from a person's decrease in selfcare and a simultaneous increase in dependency on nursing care whenever needs must be satisfied*'.

Data sources

The essential next step is to review relevant literature. From the concept under review, two elements can be derived for further literature review: *care* and *dependency*. *Care* is a key term related to the nurse as well as attributable to the patient, *dependency* is a patient-related key term (Stevens Barnum, 1990). Two sources were consulted: dictionaries and professional literature.
Walker and Avant (1995) identify dictionaries as potential source for identifying uses of concepts. Two dictionaries were used to examine the uses of the two key terms mentioned above: *care* and *dependency*. They are *Cambridge International Dictionary of English* (1995) and *Collins Cobuild English Language Dictionary* (1988). According to Cambridge Dictionary (1995), the word *care* in the sense of 'protection' means 'the process of or responsibility for protecting and giving special attention to someone or something', and *care* in the sense of 'attention' means 'serious attention, especially to the details of a situation or something'. Furthermore, this dictionary states that 'dependence is a state of needing something or someone, especially in order to continue existing or operating'.

Collins Dictionary (1988) describes *care* as 'the act of constantly providing what a person (...) needs to keep them in good condition or to make them well, and to make sure that they do not come to any harm', and *dependency* as 'a constant and regular need that someone has for something (in order to be able to survive or operate properly) or the need that someone has for another person, (...)'. As can be seen, the term *dependency* is 'a state of' and the core of this state is a 'need', which makes the person dependent on another person.
The word *(nursing)-care* contains the answer to a person's state of dependency by 'protecting', 'giving attention', and 'providing what a person needs'. *Care* is not passive, but it actively changes a person's current state.
Concerning the two key terms, the following is found in the nursing literature by Abdellah, Henderson, and Orem. Abdellah (1986) describes healthy persons as having the ability to provide for the satisfaction of their own physical, emotional, and sociological needs. An impairment that limits the ability to satisfy these needs, can cause a need for nursing care. Nursing care is directed toward making the patient better able to help himself. This implies that nursing care should aim at having the patient help himself to a state of independency.
Henderson (1966) notices the following about *care* and *dependence*. It was Henderson's belief that health is basic to all human functioning and equates with independence on a continuum that has illness equated with dependence. In this view, the desired outcome of nursing care is the patient's independence. Dependence on nursing care refers to nursing activities which patients will perform unaided if they have the necessary strength, knowledge or will. Therefore, during a certain period of dependence the nurses will do their utmost to meet the patients' needs, but they will only do this with a view to making their patients independent of nursing assistance as rapidly as possible. Before carrying out nursing interventions, nurses ask themselves what the patient can do on his own, independent of the nurse. Successful outcomes of nursing care are based on the speed with which the patient independently performs the activities that make, for the patient, a normal day. The nurse serves as a substitute for whatever the patient lacks in order to make him or her 'complete', 'whole', or 'independent' (George, 1990).
Orem's (1985) theory of self-care provides another contribution to clarifying the key terms *care* and *dependency*.

The essence of Orem's ideas about care are formed by the constructs of self-care, self-care deficits, and nursing system. These are the main points where nursing converges on the health state of an individual. Orem (1985) defines self-care as actions which persons perform on their own behalf in maintaining life, health and well-being. Self-care deficits exist when an individual's abilities to perform self-care are less than those required to meet specific health care demands.
The basic design of a nursing system is that of a helping system (Orem, 1985). The term nursing system stands for all the actions and interactions of nurses and patients in nursing practice providing the necessary help for patients.
Persons with a legitimate need for nursing are characterized by a demand for discernible kinds and amounts of self-care.
There are three possible relationships between care abilities and care demands: greater than, equal to, or less than/not adequate (Hartweg, 1991). Nursing is a legitimate service when self-care abilities are less than required, and also when these abilities exceed or are equal to those required for meeting the current self-care demands, but a future deficit can be foreseen.
Orem speaks of dependency when nursing assistance is needed. Dependency exists when the patient's self-care ability decreases and care demands make the patient wholly or partly dependent on nursing care.

Stating the theoretical definition of Nursing-Care Dependency

The starting-point for defining nursing-care dependency is the frame of reference of dependency described by Van den Heuvel (1976). This frame consists of four elements:

1 Definition of the situation
2 Reaction to that definition
3 Discrepancy in perceptions
4 Negative evaluation

These four elements fit a frame of reference regarding the concept of nursing-care dependency.
Instead of the general term for the first element - 'definition of the situation' -, the more specific terms 'patient system' and 'professional system' will be used.

The patient system communicates its disabilities, needs or deficits in regard to selfcare to the professional system in terms of care demands. And because of cognitive and communicative limitations in the way in which psychogeriatric and mentally handicapped patients express their care demands, a distinction will be made between explicit and implicit care demands. Regarding the second element, Goffman (1961) and Lasch (1979) have cautioned against patients' dependency on the professional system, and against the helping professions reducing the patient to incompetence and relieving him of responsibility.

According to Jirovec and Kasno (1993), unnecessary dependency is also fostered because institutionalized persons are not encouraged to maintain any remaining independent, self-care behavior.

Miller (1985a, 1985b) notices that, while nursing is normally a direct result of patient dependency, prolonged exposure to nursing activities can result in increased patient dependency. Especially in the long-term care facilities, professional workers such as nurses, have a keyrole in assessing the patient's care demands. By 'affirming' or 'denying' these care demands, the professional worker decides what will be done and what not: in other words, the carer determines the beginning of a caring process. Regarding the third and fourth element, professional workers like nurses have a critical role in maintaining the patient's dependency status or turning his/her dependency into independence.

Therefore, agreement about the care demand and a joint goal for action are needed. As Paterson and Zderad (1988, p.24) state: 'Both patient and nurse have a goal or an expectation in mind. Therefore, the intersubjective transaction has meaning for them; the event is experienced in the light of their goals'. The patient's expectation has been translated into the perspective of working on his independence. Theoretically, three outcomes can be expected: dependency increases, remains unchanged, or decreases. So the following frame of reference can be developed.

Figure 2 reveals the train of thought which led to defining the theoretical concept of nursing-care dependency used in this study. This study concerns persons who are not able to manage their mental health problems and, consequently, need care assistance in a long-term care facility. For nurses, this is the starting point of a caring relationship with the patient.

From the viewpoint of the patient, there is a care demand resulting from an absence or inadequacy of required self-care, which makes him/her wholly or partly dependent on nursing-care.

Figure 2 Frame of reference of nursing-care dependency

Patient system	**Professional system**		
	Assessment	**Agreement**	**Perspective**
The patient communicates his care demand explicitly (real or unreal)	The nurse affirms the care demand	Joint goal for action	Decreased patient's dependency
	The nurse denies the care demand	Separate goal for action	Unchanged or increased patient's dependency
The patient communicates his care demand implicitly (real or unreal)	The nurse denies the care demand	Separate goal for action	Unchanged or increased patient's dependency
	The nurse affirms the care demand	Joint goal for action	Decreased patient's dependency

For a nurse, the patient's care demand is the starting-point of a process in which he/she takes care of that particular patient. This means taking responsibility for providing the patient with what he/she needs. The purpose of nursing care is changing the patient's state of dependence into a state of independence. It is a movement of the patient away from nursing care toward self-care without direct assistance. In summary, the following theoretical definition can be posed: '*nursing-care dependency is a process in which the professional offers support to a patient whose self-care abilities have decreased and whose care demands make him/her to a certain degree dependent, with the aim of restoring this patient's independence in performing self-care*'.

Specifying Variable Dimensions Derived from the Theoretical Definition

The second step in the present study will be to determine which framework is useful in specifying the variable properties of the concept of nursing-care dependency as established in the theoretical definition.

The following aspects of care dependency were measured in the literature reviewed. Benoniel, McCorkle and Young (1980) developed a Social Dependency Scale, which measures three capacities of patients with chronic illnesses: everyday selfcare competence, mobility competence, and social competence. Hardy, Capuano and Worsam (1982) examined the effect of care programmes on the dependency status of elderly residents in an extended care setting.

Among other things, a tool to measure the patient's nursing dependency status was used. This tool measures requirements for nursing staff time in terms of workload generated by patients' needs. Miller (1985a, 1985b) studied the dependency of elderly patients in wards using different methods of nursing care. The incidence of dependency in elderly people and patient dependency in relation to nursing care was discussed. Patient dependency was measured by using a scale which rated the patients' level of physical dependency, apathy, social disturbance, communication difficulties and incontinence. Frederiks (1990) compared residents of old people's homes to elderly people living at home. The care needs of these residents were measured by inventorying their performance of household and daily living activities (HHA and ADL).

For policy purposes as well as for the provision of individual care, Maaskant (1993) investigated the care dependency of elderly, mentally handicapped people.

Jirovec and Kasno (1993) studied predictors of self-care abilities among the institutionalized elderly. Self-care abilities were measured using the Appraisal of self-Care Agency (ASA-A) scale (Evers, 1989). Dijkstra, Groothoff and Dassen (1995) compared the need for care in three types of Dutch institutions: nursing homes, old people's homes, and home-care. For that purpose, the authors measured the degree of dependence for ADL-functions (Activities in Daily Living), incontinence, and mobility.

In all these studies the care dependency concept was used to search for a method by which the dependency of a population can be measured. Similarly, George (1991, p. 178) concluded that 'researchers and planners have attempted to define the quality of dependency in ways which will help them to assess the need for, and calculate the workload entailed in providing, continuing or long-stay accommodation for the elderly population'.

As mentioned earlier, relevant supporting literature of three nurse-need theorists will be discussed here.

In contrast to a medical orientation, the ideas of the theorists may be characterized as based on Maslow's hierarchy of needs, and influenced by Erikson's stages of development (Fitzpatrick & Whall, 1989; Riehl, 1989; George, 1990; Meleis, 1991). Maslow (1970) identified basic human needs as physiological needs, safety needs, belongingness and love needs, esteem needs, and the need for self-actualization.

The influence of Maslow is evident in the work of Abdellah, Henderson, and Orem. Although their formulations are different, each of the three theorists identifies need requisites which correspond to Maslow's basic human needs.

In Abdellah's model (1960), the concept of nursing is expressed in a typology of 21 nursing problems which encompass the physical, sociological, and emotional needs of the patient. The nursing activity typology of 21 nursing problems represents the categories or classifications of nursing action that can influence responses in the patient condition (Fitzpatrick & Whall, 1989).

Henderson (1966, 1985) specified 14 components of basic nursing care. They remain comprehensive, complete, and consistent with various hierarchies and levels of human needs (Yura & Walsh, 1983). The components start with physiological functioning and move to the psychosocial aspects, which may convey that bodily operation takes priority over emotional or cognitive status (George, 1990).

These basic needs address not health problems of the patient, but areas in which actual or potential problems might occur (Gordon, 1994). According to Fitzpatrick and Whall (1989), Henderson's 14 components of care helps the nurse move the patient from a state of dependence to a state of independence.

Orem (1985, 1995) identified three types of self-care requisites: universal, developmental, and health-deviation.

Each type of requisites represents a category of deliberate actions to be taken by or for the patient because of his or her needs as a human being. Universal self-care requisites are common to all human beings. Developmental self-care requisites are associated with human developmental processes or they are new requisite derived from a condition or associated with an event. Health-deviation self-care requisites are associated with genetic and constitutional defects. Orem's eight universal self-care requisites, common to all human beings, more or less coincide with Henderson's 14 human basic needs (Meleis, 1991).

Characteristics of basic human needs cover a broad range of physical and psychosocial needs. In the frameworks presented, physical needs dominate. Nursing theorists associate these needs with air, food, elimination, sleep, exercise, temperature. As long as these physical needs are unsatisfied, all other needs get low priority in need fulfilment. Nursing theorists identify psychosocial needs such as self-concept, role function, interdependence, education, and family.

For the following reasons, Henderson's framework provides a good starting-point to specifying the variable aspects of the concept of nursing-care dependency.

1 As stated, it was Henderson's belief that health is basic to all human functioning and equates with independence on a continuum that has illness equated with dependence. In this view, the desired outcome of nursing care is the patient's independence. The 14 human needs help the nurse move the patient from a state of dependence (...) to a state of independence (Fitzpatrick & Whall, 1989).
2 Henderson speaks about *fundamental* human needs which appear in every patient-nurse relationship, independent of the patient's age and/or the type of care setting.
3 Henderson's ideas are frequently applied in practice and in the curriculum for educating nursing students working in long-term care facilities, for example, in the Netherlands.

So Henderson's components of nursing care are used to specify the 14 variable aspects of the concept of nursing-care dependency.

To allow them to be useful in the context of the research project, Henderson's 14 human needs have been translated into 14 nursing-care dependency (NCD) items (see Figure 3).

Figure 3 Translation of Henderson's 14 human needs in Nursing-Care Dependency (NCD) items of nursing care

	Henderson's 14 human needs		14 NCD items of nursing care
1	Breathing normal	1	Eating and drinking
2	Eat and drink adequately	2	Incontinence
3	Eliminate body wastes	3	Mobility
4	Move and maintain desirable posture	4	Body posture
5	Sleep and rest	5	Rest and sleep
6	Suitable clothes-dress and undress	6	Getting dressed and undressed
7	Maintain body temperature within normal range by adjusting clothing and modifying the environment	7	Body temperature
8	Keep body clean and well groomed and protect the integument	8	Hygiene
9	Avoid dangers in the environment and avoid injuring other	9	Avoidance of danger
10	Communicate with others in expressing emotions, needs, fears, or opinions	10	Contact with others
11	Worship according to one's faith	11	Sense of standards and values
12	Work in such a way that there is a sense of accomplishment	12	Daily activities
13	Play or participate in various forms of recreation	13	Recreation
14	Learn, discover, or satisfy the curiosity that leads to normal development and health and use the available health facilities	14	Learning ability

From Henderson V. (1966) *The Nature of Nursing*

Identifying Observable Indicators

According to Challis, Carpenter and Traske (1996), it is widely agreed that the best way to address the patient's care needs is by thorough and systematic assessment. The importance of regular assessments is evidenced by the frequency of acute and sub-acute changes in health status which may occur in patients in long-term care settings (Bernadini *et al.*, 1993).

Iyer, Taptisch and Bernocchi-Losey (1986) identified four types of assessment data: subjective, objective, historical, and current data. Here, where patients with cognitive and communicative disfunctions are unable to share reliable information about their care dependency with their nurse, the focus is on objective data. Cox *et al.* (1993) define objective data as those facts that are observable and measurable by the nurse.

When selecting observable and measurable indicators, Waltz *et al.* (1991) suggests that it is important to determine whether the concept represents an either-or phenomenon or one that varies. Nursing-care dependency can be defined as variable in intensity. The described theoretical definition represents one end of a continuum, ranging from total patient dependency to total independence, in activities related to the specified 14 variable properties of the concept of nursing-care dependency.

In order to measure the patient's degree of nursing-care dependency, the number of indicators must be determined. Nursing literature refers to a number of indicators, varying from three to five. For example, Cox *et al.* (1993) mention five dimensions for rating areas of self-care: completely independent; requires use of equipment or device; requires help from another person, for assistance, supervision, or teaching; requires help from another person and equipment device; and dependent, does not participate in activity (Code adapted by NANDA from E. Jones *et al.*, Patient Classification for Long-Term Care: User's Manual. HEW Publication No. HRA-74-3107, November 1974). For each of the 14 dimensions of nursing-care dependency it was decided to conceptualize five written indicators, ranging from totally dependent to totally independent. With these indicators the patient's care dependency can be evaluated.

Developing Means for Measuring the Indicators

Structured assessment instruments can assist in screening for problems that often remain undetected in older patients, and they can be adopted as part of everyday practice (Applegate, Blass & Williams, 1990). Assessment instruments may be helpful to complete the measurements of patients' indicators. Two instruments have been designed as means for measuring the 14 dimensions of nursing-care dependency.

Each version consists of the following components: (1) a label, (2) a description of the given label, and (3) five indicators to determine the degree to which patients depend on nursing care. The difference between the two versions is the way in which care dependency is assessed. Responses on the clinical scale are rated on the basis of five written criteria, whereas all ratings of the research version are on a five-point Likert-scale, ranging from 1 (completely care dependent) to 5 (completely independent). The present study can be ended by stating an operational definition of the concept of nursing-care dependency: '*the degree of dependency on nursing care with regard to the 14 dimensions of human needs, experienced by a long-term care patient*'.

Implications for Further Research

The intention of this paper was to operationalize the concept of nursing-care dependency as a first step in a research project to develop and test an instrument measuring care dependency of patients admitted in long-term care facilities. The operationalization procedure of Waltz *et al.* (1991) was used. The given theoretical and operational definitions are tentative in nature, in order to generate future discussion and refinement.

The next step will be further clarification of the need framework and its indications for measurement by nurses working in practice. What really needs to be known is which indicators measure the dependency on nursing care from the patient's perspective. Therefore, not only a valid and reliable measurement instrument is needed, but also an attitude of empathy by raters measuring patients' dependency.

This attitude can be best described in the words of Henderson (1985): 'to get inside the patient's skin'.

3 Nursing-Care Dependency

Development of an assessment scale for demented and mentally handicapped patients

Ate Dijkstra, Girbe Buist, Theo Dassen

Abstract

This paper describes the first phase in the development of an assessment scale of nursing-care dependency (NCD) regarding Dutch demented an mentally handicapped patients. It is focused on the background to the study and content validation of the nursing-care dependency scale. The scale aims to characterize the patients' nursing-care dependency as part of the assessment step in the nursing process, and is based on Henderson's 14 human needs. The Delphi technique, using two panels of experts (n=44), was applied to reach consensus on significant indicators of nursing-care dependency. The experts' reasoning was used to develop criteria for the assessment of nursing-care dependency. Ultimately, the Delphi rounds generated 15 NCD items with their descriptions and item criteria. There was no fundamental difference between the NCD scales for demented and mentally handicapped patients. Nevertheless, there are two versions of the NCD scale because of the need to apply specific concepts in the nursing care of either population. The original Dutch version of the NCD scale is also available in English and in Norwegian.

Introduction

Literature search shows that, contrary to other professionals involved in evaluating demented and mentally handicapped patients, nurses do not have an assessment scale with which they can measure these patients' care dependency (Abraham, Smullen & Thompson-Heistermann, 1992; Kam van der, Mol & Wimmers, 1971; Verstraten & van Eekelen, 1987; Kraijer & Kema, 1985).

The fact that there was no such scale for Dutch demented and mentally handicapped patients gave rise to the study to be presented here. The present study is part of a larger investigation focusing on the development of a nursing-care dependency scale for demented and mentally handicapped patients.
A phased programme was decided on to develop the scale. The aim of this particular part is to give a comprehensive account of the development and content validation of the scale.

Nursing-care dependency

Contrary to other members of the health profession, nurses are involved with human needs that affect the total person rather than one aspect of need fulfilment (Yura & Walsh, 1983). When the patient's abilities to meet human needs are less than required, care dependency exists. Nursing interventions are then required to assist the patient in satisfying his needs and prevent further loss of independence. This requires a precise determination of what kind of care should be provided and what it should consist of.
A thorough comprehensive assessment is critical for planning individualized nursing care. The nurse's effectiveness in assessing care dependency depends, among other things, on the knowledge of human needs. A framework of human needs to be assessed provides the basis for recognizing changes in a patient's state of care dependency. Especially, when patients with cognitive and communicative disfunctions are unable to share reliable information about their care dependency with their nurse, the nurse can use a framework of human needs as a tool to collect data from the patient in a systematic and objective way. Human needs theory can serve as a framework of human needs and provides a knowledge base for the application of an assessment scale. A literature survey of human needs theory showed that, for the following reasons, Henderson's theory concept on nursing provides a good starting-point for the conceptualizing of nursing-care dependency.

1 In Henderson's definition of nursing, the person is composed of biological, sociological, and spiritual components. These components are expanded upon in the 14 human needs. Henderson's 14 human needs represent a useful framework.

These 14 components of human nursing care remain comprehensive, complete, and consistent with various hierarchies and levels of human needs (Yura & Walsh, 1983). Gordon (1994) notes that these human needs do not address health problems of the patient but areas in which actual or potential problems might occur.

Nursing care is needed when one of more of these needs are unmet and when a person is not able to fulfil his own needs (Meleis, 1991). Human needs include more physiological parameters than social, cultural, or spiritual ones (Fitzpatrick & Whall, 1989).

According to George (1990), another shortcoming in Henderson's work is the lack of conceptual linkage between physiological and other human characteristics.

2 It is Henderson's belief that health is basic to all human functioning and equates with independence on a continuum that has illness equated with dependence. In this view the desired outcome of nursing care is the patient's independence. According to Fitzpatrick and Whall (1989), the 14 human needs help the nurse move the patient from a state of dependence (...) to a state of independence. Henderson (1966) notices the following about dependence. Firstly, dependence on nursing care refers to nursing activities which patients will perform unaided if they have the necessary strength, knowledge or will. Secondly, during a certain period of dependence the nurses will do their utmost to meet the patients' needs, but they only do this with a view to making them independent of nursing assistance as rapidly as possible. Before carrying out nursing interventions, the nurses ask themselves what the patient can do on his own, independent of the nurse. Lastly, successful outcomes of nursing care are based on the speed with which, or the degree to which, the patient performs independently the activities that make, for the patient, a normal day. The nurse serves as a substitute for whatever the patient lacks in order to make him or her 'complete', 'whole', or 'independent' (George, 1990).

3 Henderson speaks about *fundamental* human needs which appear in every patient-nurse relationship.

That is why the NCD scale has been developed in the Dutch situation for use in both psychogeriatric nursing homes and institutions for the mentally handicapped.

Aim of Study

The work reported on in this paper is confined to investigating the content validity of the NCD scale. The aim of the study is as follows: Develop a content validity scale for demented and mentally handicapped inpatients to assess the nursing-care dependency of these patients.

In this study nursing-care dependency exists when the need for care makes the patient dependent of nursing care. The nursing-care dependency concept consists of the following components: (1) a framework of human needs to be assessed with which patients' care dependency can be evaluated; (2) determination of the degree to which patients depend on nursing care.

Demented patients are defined as psychogeriatric nursing home patients with cognitive impairment and/or behavioral problems characterized by a complex interaction of physical, mental, and social factors (Gerritsen *et al.*, 1995; Hogstel, 1995). Mentally handicapped is a label for intellectual-cognitive deficits impairing an individual's ability to adapt to the daily-living, social, and work demands of their environment (McFarland & Durand Thomas, 1991; Maaskant, 1993).

Methods

Development of the NCD scale

Content validity constitutes an essential part of the development of an assessment scale. Through testing the content validity it is possible to check wether NCD concept gives a correct representation of care dependency with regard to populations mentioned. According to Lynn (1986), determination of the content validity takes place in a structured way using two steps: development and judgment-quantification.

Figure 4 Translation of Henderson's 14 human needs in Nursing-Care Dependency (NCD) items of nursing care

	Henderson's 14 human needs		14 NCD items of nursing care
1	Breathing normal		
2	Eat and drink adequately	1	Eating and drinking
3	Eliminate body wastes	2	Incontinence
4	Move and maintain desirable posture	3	Mobility
5	Sleep and rest	4	Body posture
6	Suitable clothes-dress and undress	5	Rest and sleep
7	Maintain body temperature within normal range by adjusting clothing and modifying the environment	6	Getting dressed and undressed
8	Keep body clean and well groomed and protect the integument	7	Body temperature
9	Avoid dangers in the environment and avoid injuring other	8	Hygiene
10	Communicate with others in expressing emotions, needs, fears, or opinions	9	Avoidance of danger
11	Worship according to one's faith	10	Contact with others
12	Work in such a way that there is a sense of accomplishment	11	Sense of standards and values
13	Play or participate in various forms of recreation	12	Daily activities
14	Learn, discover, or satisfy the curiosity that leads to normal development and health and use the available health facilities	13	Recreation
		14	Learning ability

From Henderson V. (1966) *The Nature of Nursing*

The first step is taken by conceptualizing the first version of the NCD scale. The 14 components of Henderson's human nursing care have been translated into the first concept-version of the assessment scale (Figure 4).

Two changes have been introduced. Firstly, Henderson's 'Breathing normally' has been excluded.

Secondly, the human need called 'Move and maintain desirable postures' has been split into two NCD items: 'Mobility' and 'Body Posture'. Descriptions were added to each of the 14 NCD items.

The item descriptions were formulated as shown in the following example: 'Incontinence: the extent to which the patient is able to control the discharge of urine and faeces voluntarily'.
The second step concerns determination of the degree to which the separate items, item descriptions and item criteria of the scale adequately represent the content of NCD. Content validation of a scale requires the cooperation of a panel of experts and is necessarily based on judgments (Polit & Hungler, 1991).

The Delphi survey technique

In operational terms the aim of the study pertains to the development of standards for assessing patients' nursing-care dependency. Since this calls for a rather qualitative approach, the Delphi technique was chosen.
The main reasons were:

1 The aim of the study does not lend itself to precise analytical techniques, but can benefit from subjective judgments on a collective basis (Linstone & Turoff, 1975).
2 Contemporary nursing literature shows increasing evidence of the successful use of the Delphi technique as a survey method in a wide range of problem areas, including the setting of standards (McKenna, 1994).
3 Nurses can give a range of opinions and judgments because of their practice and knowledge of the demented or mentally handicapped patients and their key role in assessing the nursing-care dependency of these patients.

Furthermore, the strength of this technique lies in its ability to provide a systematic and structured collection and aggregation of informed judgments from a group of experts on specific questions or items (Reid, 1988). Panellists give their opinion on paper and independent from each other (Dassen & Keuning, 1992). The Delphi technique consists of two or more rounds.
Responses to each round of questionnaires are analyzed, summarized and returned to the experts with a new questionnaire to reformulate their opinion (Polit & Hungler, 1991). This process is repeated until a high degree of consensus is reached.
A number of limitations to the technique are documented in nursing literature (McKenna, 1994; Reid, 1988; Williams & Webb, 1994).

The main limitations of the Delphi technique are the following: size and composition of the panel, low response rate, and the scientific credibility and reliability of the technique.

Panel composition and size

It was decided to involve nurses from both types of institutions, for example psychogeriatric nursing homes and institutions for the mentally handicapped, as sample population for the Delphi survey. Criteria for the selection of both groups of panel experts were mainly based on the degree of expertise and involvement in nursing practice. As a result, 44 nurses agreed to take part in the Delphi survey. Both groups of panellists were asked to give their judgment twice about the questionnaire. Table 1 summarizes the composition of the panel and the response rate in the two Delphi rounds.

Table 1 Number of institutions, panellists and response rate in the Delphi rounds

	Psychogeriatric nursing home		**Institutions for the mentally handicapped**		**Total**	
	n	**%**	***n***	**%**	***n***	**%**
Institutions:	9	60	6	40	15	100
Panellist:	25	57	19	43	44	100
Response rate:						
- round 1	24	96	19	100	43	98
- round 2	22	88	16	84	38	86

Round 1 of the Delphi survey

Round 1 consisted of sending the first version of the NCD scale to both groups of panellists. Both panels of experts were asked to give a written appraisal about the items' relevance for inclusion in the NCD scale.

They were also encouraged to give a rationale for their judgments. For each item, panellists were asked to judge the relevance of the items to nursing-care dependency of demented or mentally handicapped patients. The same question was asked for the item descriptions.

The next question asked whether any items were missing and this was specifically included to give a full assessment of nursing-care dependency of demented or mentally handicapped patients.
Lastly, the panellists were asked to give general suggestions or comments on the assessment scale and the questionnaire.
To assess the suggestions and comments of the panellists, the *content* of the critique in particular was taken into consideration. According to Polit & Hungler (1991), there are no completely objective methods for ensuring an adequate content coverage of a scale. Therefore with regard to consensus, it was decided that 75% agreement should be used as the criterion of consensus. This 75% level of panel agreement was set to decide whether a nursing-care dependency item should be included in the NCD scale.

Table 2 Percentage agreement among panellists (n=43) on the items of nursing-care dependency

	Percentage agreement		
Items of nursing-care dependency	**Total (n=43)**	**Nursing home (n=24)**	**Institution of the mentally handicapped (n=19)**
Eating and Drinking	100	100	100
Getting (Un)dressed	98	96	100
Mobility	95	92	100
Incontinence	91	92	89
Hygiene	91	88	95
Sense of Standards/ Values	91	92	89
Daily Activities	91	88	95
Avoidance of Danger	88	83	95
Learning Ability	88	83	95
Body Posture	88	88	89
Contact with Others	88	88	89
Rest and Sleep	84	88	79
Recreation	79	76	84
Body Temperature	72	67	79

Round 2 of the Delphi survey

The main aim of the second round of the Delphi survey was to achieve a consensus by asking both panels to evaluate the changes made to the NCD scale.

Both groups of panellists were asked to indicate on a 5-point Likert scale their degree of agreement with each revised item and item description. A written rationale for their judgments was requested as well.

The second aim of round 2 was to obtain a judgment from the panellists about the newly-added item criteria of each item. These 5 levels of care dependency represent a care-continuum from complete care dependency to complete independence. Both groups of panellists were first asked to indicate on a 5-point Likert-scale their judgment about the proposed item criteria and then to add their motivation. Once again it was decided to assess whether an item description or item criterion should be included or excluded in the NCD scale comments: first on the basis of the content of the written critique and, secondly, on the basis of the percentage agreement.

Results

Results of round 1 of the Delphi survey

Response rates were 96% for the nursing home panel and 100% for the panellists of institutions for the mentally handicapped. As can be seen in Table 2, only the 'Body Temperature' item was judged by both panels as not being relevant to nursing-care dependency, with 72% agreement. High levels of agreement on the relevance of the remaining 13 items were obtained, ranging from 79 to 100%. Almost all panellists offered suggestions about reformulating one or more item descriptions. Most of the suggestions were based on the participants' clinical practice with the target population. An important outcome was that all respondents (100%) of both panels suggested that 'Communication' should be added as an item on the NCD scale. The results of round one of the Delphi survey were used for modifications to the scale on the basis of the panellists' responses, suggestions, and comments. The suggested item, 'Communication', was added to the scale.

In order to achieve greater clarity three items were reformulated: 'Daily Activities', 'Rest and Sleep' and 'Recreation'.

The 'Body Temperature' item was retained in the NCD scale notwithstanding the agreement rate being below the cut-off score.

Analysis of comments revealed that the panellists' rejection was not especially based on the inclusion of this item in the NCD-scale. The comments were related to the item description.
Item descriptions were rewritten on the basis of the panellists' comments and in the wording of the specific practices of psychogeriatric nursing homes or institutions for the mentally handicapped. Lastly, 5 concrete behaviour descriptions were developed for each NCD item to serve as scoring criteria. An example is given in Figure 5.

Figure 5 Example of an item with its item description and item criteria.

Item	**Incontinence**
Item description	The extent to which the patient is able to control the discharge of urine and faeces voluntarily
Item criteria	(1) Patient is unable to prevent the discharge of urine and /or faeces; is completely incontinent (2) Patient is unable to control the discharge of urine and/or faeces; spontaneous discharge of excretions is impossible without assistance and/or use of aids (3) Patient is able to be continent most of the time, if guided by fixed patterns (4) Patient is able to control excretions unaided most of the time; sometimes uses unsuitable places (5) Patient is able to control excretions unaided

Results of round 2 of the Delphi survey

The survey was sent to all the participants in the first round of the survey. Response rates were 88% for the nursing home panel and 84% for the panellists of institutions for the mentally handicapped. All respondents of both panels agreed with the 15 items included in the revised scale.
This suggests that the revised scale accurately reflected the suggestions and comments given by both panels in the first Delphi round.
To assess the item descriptions, the Likert scores were reduced to a 3-point scale. The difference between the scores '*strongly agree*' and '*agree*' on the one hand and '*strongly disagree*' and '*disagree*' on the other were eliminated. The agreement rate was again set at 75%. Because of the use of the Likert scale a 25% disagreement rate was also set.

The purpose of this was to decide, whether an item description or item criterion should be included in the NCD-scale by reformulation (disagreement<25%), or excluded (disagreement rate>25%). Table 3 shows that the 75% agreement rate was obtained from both panels on 14 of the 15 item descriptions. With regard to three of the item descriptions, less than 75% agreement was found among the panellists of the nursing home panel. These were the items 'Incontinence' (73%), 'Body Temperature' (68%) and 'Contact with Others' (64% agreement). These three item descriptions were reformulated and not excluded from the scale because of the following two reasons. First, the panellists were not very critical in their comments on the descriptions. Secondly, the disagreement rates were less than 25%: 'Incontinence' (0%), 'Body Temperature' (14%) and 'Contact with Others' (18%). It was concluded that the assessment of the 15 NCD item descriptions indicated a high level of consensus among both groups of panellists.

Table 3 Percentage of agreement (disagreement) among panellists (n=38) on the item description

	% agreement (% disagreement)					
Item description, belonging to the following items of nursing-care dependency	Total (n=38)		Nursing home (n=22)		Institution of the mentally handicapped (n=16)	
Recreational Activities	95	(3)	91	(5)	100	(0)
Communication *)	92	(0)	91	(0)	94	(0)
Sense of Rules and Values *)	92	(0)	91	(0)	94	(0)
Avoidance of Danger	92	(3)	86	(5)	100	(0)
Day/Night Pattern	92	(5)	91	(5)	94	(6)
Learning Ability *)	89	(5)	91	(0)	88	(13)
Getting (Un)dressed	89	(5)	86	(5)	94	(6)
Hygiene *)	87	(3)	82	(5)	94	(0)
Eating and Drinking	87	(3)	86	(0)	88	(6)
Body Posture	87	(8)	91	(5)	81	(13)
Mobility	84	(11)	91	(5)	75	(19)
Daily Activities	82	(5)	77	(5)	88	(6)
Incontinence *)	79	(3)	73	(0)	88	(6)
Body Temperature	79	(11)	68	(14)	94	(6)
Contact with Others *)	74	(16)	64	(18)	88	(13)

*) One or two missing values

The second aim of round 2 of the Delphi survey was to obtain a judgement on the item criteria for each NCD item. Again the Likert-scores were reduced to a 3-point scale. The agreement rate was set at 75% and the disagreement rate at 25%.

Table 4 shows that the participants of both panels agreed with the proposed item criteria for 11 of the 15 NCD items.
Furthermore, none of the 4 rejected criteria of the NCD items 'Getting Dressed and Undressed', 'Communication', 'Mobility' and 'Day/Night Pattern', received a disagreement rate higher than 25%: scores ranged from 3% (lowest) to 11% (highest).
However, the panels differed in their agreement patterns. For example, the nursing home panel agreed with 11 of the 15 item-criteria: agreement rates ranged from 77% (lowest) to 91% (highest). The corresponding result of the panel from institutions for the mentally handicapped was agreement about 8 of the 15 item criteria, ranging from 75% (lowest) to 100% agreement (highest). Both panels were also divided among themselves about their acceptance of the wording of the criteria.
There was full agreement (>75%) about the text of 6 item criteria. The panels' opinions differed about the remaining 9 item criteria. The criteria of all NCD items could be rewritten, because a disagreement rate higher than 25% was not found.
The new text was composed on the basis of the motivations and reactions of the 'doubtful' panellists in particular.
In addition, for both demented and mentally handicapped patients the wording of the NCD criteria was standardized as much as possible, with some minor population-specific differences remaining for 'Avoidance of Danger', 'Daily Activities' and 'Recreational Activities'.

Table 4 Percentage of agreement (disagreement) among panellists (n=38) on the item criteria

Item description, belonging to the following items of nursing-care dependency	% agreement (% disagreement) Total (n=38)		Nursing home (n=22)		Institution of the mentally handicapped (n=16)	
Hygiene *)	92	(0)	86	(0)	100	(0)
Recreational Activities	87	(0)	86	(0)	88	(0)
Avoidance of Danger	87	(0)	86	(0)	88	(0)
Daily Activities	84	(3)	86	(5)	81	(0)
Learning Ability *)	84	(5)	91	(0)	75	(13)
Incontinence *)	82	(0)	77	(0)	88	(0)
Body Temperature	79	(3)	68	(0)	94	(6)
Body Posture	79	(3)	91	(0)	63	(6)
Sense of Rules and Values *)	79	(8)	86	(5)	69	(13)
Eating and Drinking	76	(8)	73	(0)	69	(6)
Contact with Others *)	76	(3)	82	(0)	69	(6)
Getting (Un)dressed	74	(3)	77	(0)	69	(6)
Communication *)	68	(0)	68	(0)	69	(0)
Mobility	68	(11)	73	(5)	63	(19)
Day/Night Pattern	63	(5)	59	(5)	69	(6)

*) One or two missing values

Discussion

In this article an account is given of the development and content validity of a scale assessing nursing-care dependency. The NCD scale has been developed as an assessment tool to give a validated judgment about the patient's care dependency.
At the same time, the NCD scale will inform the nurse about the patient's ability to function in a dependent or an independent way in relation to the given NCD items. Henderson's definition of nursing has proved to be useful for the development of the NCD-scale.
Its major component, expanded upon in the 14 human needs, was tested empirically by means of the Delphi survey. Henderson's 14 human needs appeared to be useful, and supplied a basis for the ultimate model of the assessment scale. One human need, 'Breathing normally', was withdrawn, while another human need, 'Move and maintain desirable postures', was split.

In general, the panellists' comments are consistent with the literature on Henderson's original list of human needs. Only one item, 'Communication', was added to Henderson's 14 human needs. Therefore it can be argued that the NCD item list is representive of patients' care dependency. The development phase of the NCD scale was followed by a content validation of the assessment scale. The content validity of the NCD scale was evaluated in two ways. First, content validation was carried out by panellists using the Delphi survey, consisting of two Delphi rounds. Ultimately, both Delphi rounds generated 15 validated NCD items with their item descriptions and item criteria. The decision to choose two groups of panellists appeared to be a good way to develop an assessment scale useful for both demented and mentally handicapped patients. For each group of patients an assessment scale with an identical structure in content regarding NCD items and their descriptions and criteria was developed. Secondly, each item was carefully studied and specified, and the several ways to measure the items were evaluated. From the results obtained thus far it does not appear that the NCD scale is not content valid, which means that further study can be carried out into the validity and the reliability of the NCD scale.

Conclusion

For the present, a positive answer can be given to the question whether in this study a content validated scale to assess nursing-care dependency has been developed. Owing to the fact that content validation was applied to the items as well as the item descriptions and item criteria, they are all textually clear and comprehensible. The present study gives no insight into other aspects of validity, reliability and utility of the developed assessment scale concerning the assessment and classification of both groups of patients. Therefore, further investigation is required in order to describe the other aspects of validating an assessment scale.
Recommendations for future lines of enquiry are tests on interrater- and intrarater reliability, internal consistency, construct and criterion-related validity and clinical significance. English and Norwegian versions of the Dutch NCD-scale have been developed and are now available. At the moment, data collection is taking place in Norway for the Norwegian-speaking regions.

4 A Reliability and Utility Study of the Nursing-Care Dependency Scale

Ate Dijkstra, Girbe Buist, Peter Moorer, Theo Dassen

Abstract

The purpose of this study was to examine the reliability and utility of the Nursing-Care Dependency (NCD) instrument. This 15-item scale has been developed recently for assessing the care dependency of demented or mentally handicapped in-patients. Data for this study were collected from 153 demented and 139 mentally handicapped in-patients. The sample was measured three times. Reliability was determined using Cronbach's alpha and ranged from .95 to .97. Interrater reliability revealed moderate to substantial weighted Kappa statistics between .51 and .83. Test-retest reliability analysis resulted in substantial weighted Kappas between .66 and .89. Utility tests also revealed satisfactory results. The findings support the reliability and utility of the NCD instrument.

Introduction

Life in psychogeriatric nursing homes and institutions for the mentally handicapped can be characterized by the high degree of patients' dependency. Many physical, cognitive and social disabilities of demented and mentally handicapped in-patients result in care dependency on nurses. In the Netherlands nurses tend to make use of assessment instruments that are based on psychological theories. Examples of these instruments are the Rating Scale for Elderly Patients (Van der Kam, Mol, & Wimmers, 1971), the Behavior Observation Scale for Intramural Psychogeriatrics (Verstraten & Van Eekelen, 1987; Verstraten, 1988), and the Scale for Social Functioning (Kraijer & Kema, 1972).

The first two instruments are frequently used in Dutch psychogeriatric nursing homes, the third is used as the measurement instrument in most Dutch institutions for the mentally handicapped.
However, these instruments are inadequate to assess all nursing dimensions of the patient's care dependency, besides, some instruments are too long and too complicated. Among nurses, a need was identified to assess patients' care dependency on the basis of nursing theory. For use in daily practice, nurses were interested in a short and practicable instrument to assess patients' dependency on nursing care. Based on these criteria, existing (nursing) tools to measure dependency were reviewed, including the Appraisal of Self-Care Agency scale (Evers, 1989), Psychogeriatric Nursing Assessment Protocol (Abraham *et al*., 1990) and the Resident Assessment Instrument (Challis, Carpenter, & Traske, 1996). These tools were unsuited to the specific information needed by nurses for measuring dependency in Dutch long-term care patients. Another lack was that the instruments have been designed to indicate where help is needed, without regard to the care dependency status arised from these needs. As a consequence, the decisions was made to develop a more specific scale addressing the major dependency areas as identified in nursing theory. Consequently, a research project was started at the Department of Nursing Science of the University of Groningen. A phased programme was started to develop the scale and test its psychometric properties. The main aim was to develop an easy, short assessment tool that could give a reliable and validated judgment about patients' needs and nursing-care dependency status. In clinical long-term care practice, nurses should use the instrument for measuring the patient's degree of care dependency in order to plan individualized nursing care. Besides, the item measurement can be used in the further steps of the nursing process for diagnosing care dependency and for planning interventions to change the patient's dependency into a greater degree of independence. Moreover, with the outcomes of the NCD assessment in mind, the ability of nurses enhance to interact effectively with other professionals and to make a more meaningful contribution to the decisions of the multidisciplinary team.

Previous Research

Concept operationalization

The concept of nursing-care dependency was operationalized using the approach of Waltz, Strickland and Lenz (1991). Dictionaries (Collins Dictionary, 1988; Cambridge Dictionary, 1995) and professional literature (Abdellah *et al.*, 1986; Henderson, 1966; Van den Heuvel, 1976; Orem, 1995) were consulted to formulate the theoretical definition of nursing-care dependency: 'nursing-care dependency is a process in which the professional offers support to a patient whose self-care abilities have decreased and whose care demands make him/her to a certain degree dependent, with the aim of restoring this patient's independence in performing self-care' (Dijkstra, Buist, & Dassen, in press[a]). Literature about dependency and instruments to measure dependency were reviewed in order to determine a framework that would be useful in specifying the variable properties of nursing-care dependency as established in the theoretical definition (Abdellah *et al.*, 1986; Applegate, Blass, & Williams, 1990; Benoniel, McCorkle, & Young, 1980; Challis, Carpenter, & Traske, 1996; Evers, 1989; Frederiks, 1990; George, 1991; Hardy, Capuano, & Worsam, 1982; Henderson, 1966; Maaskant, 1993; Miller, 1985; Orem, 1995). For the following reasons, Henderson's framework of 14 human needs appeared to be useful in specifying the variable properties of the defined concept of nursing-care dependency. First, Henderson's human needs help the nurse move the patient from a state of dependence (...) to a state of independence (Fitzpatrick & Whall, 1989). Second, Henderson (1966) speaks about fundamental human needs which appear in every patient-nurse relationship, independent of the patient's age and/or the type of care setting. Last, Henderson's ideas frequently are applied in practice and in the curriculum for educating nursing students working in Dutch long-term care facilities.

Validation studies

In consultation with nurses in clinical practice, determination of the content validity of the NCD instrument took place in a structured way using two steps: development and judgment quantification (Lynn, 1986). To develop the NCD instrument, Henderson's human needs were modified into 14 aspects of nursing-care dependency.

For each of these aspects, it was decided to conceptualize an item description and five written criteria for measuring patients' care dependency, ranging from completely care dependent to completely independent.
The Delphi technique was applied to reach consensus about significant indicators of nursing-care dependency.
A draft version of the NCD instrument was sent for judgment to 44 raters who participated in the Delphi-survey. Following two rounds of raters' reviews of the NCD items, high levels of agreement on the relevance of the items were obtained, ranging from 79 to 100%. Therefore, all 14 proposed items were retained to represent nursing-care dependency. Further, raters identified communication as being related to the concept of nursing-care dependency; thus, this item was added to the instrument. On the basis of specific comments, minor changes with regard to item descriptions and item criteria were incorporated into the final instrument.

Figure 6 Example of an Item with its Item Description and Item Criteria

Item	Eating and Drinking
Item description	The extent to which the resident is able to satisfy his/her need for food and drink unaided
Item criteria	(1) Patient is unable to take food and drink unaided (2) Patient is unable to prepare food and drink unaided; patient is able to put food and drink into his/her mouth unaided (3) Patient is able to prepare and put food and drink into his/her mouth unaided with supervision; has difficulty determining quantity (4) Patient is able to eat and drink unaided with some supervision (5) Patient is able to prepare meals and to satisfy his/her need for food and drink unaided

An example of an NCD item is given in Figure 6 (Dijkstra, Buist, & Dassen, 1996a).
In a separate study construct validity was determined by Factor analysis and Mokken scale analysis. Data were collected for 450 demented and 203 mentally handicapped patients using the NCD instrument.

Findings from Factor analysis revealed that the 15 individual items represent one dimension of care dependency (Eigenvalue 10.721, % variance 71.5). Theoretically expected clusters of somatic and psychosocial items could not clearly be distinguished. As none of the 15 items had a factor loading lower than .40, no item reduction took place. Mokken scale analysis defines the scalability of the items and, consequently of the instrument.

Mokken scale analysis for the whole scale demonstrated a high H-coefficient (.75), which implied a strong hierarchical scale (Dijkstra, Buist, & Dassen, 1996a). From the results obtained, it appeared that the NCD instrument was content and construct valid, which means that further study into reliability could be carried out.

The present study is a subsequent component of the project focusing on the development of a Nursing-Care Dependency (NCD) scale for use in long-term care facilities. The purposes of this study were to determine the reliability and utility of the Nursing-Care Dependency scale. According to Polit and Hungler (1991), reliability is the degree of consistency or dependability with which an instrument measures the attribute for which it is designed. The higher the degree of consistency of an instrument, the lower the amount of error presented in the obtained scores. Woods and Catanzaro (1988) define utility as the need for the operationalization to be useful within the context of the investigation and the discipline of nursing.

This study was designed to answer the following questions:

1 Is the NCD instrument a reliable instrument to assess the degree of care dependency in demented or mentally handicapped patients?
2 Is the NCD instrument a useful instrument in practice?

Method

Sample

As shown in Table 5, the Dutch sample consisted of 292 patients from three psychogeriatric nursing homes and two institutions for the mentally handicapped and 136 raters (Diepenmaat, Hovius-Dragt, & Zuidersma, 1994). All raters were primary or team nurses directly involved in the patients' care during the investigation.

Between institutions the number of raters to patients varies substantially. Because of workload reasons, one institute gave preference to a one to one relation between raters and patients.

Table 5 Number of Settings, Assessed Patients (and Raters)

Setting	1	2	3	4	5	Total
Institution for the mentally handicapped	90 (90)	49 (7)				n=139 (n=7)
Psychogeriatric nursing home			48 (21)	50 (12)	55 (6)	n= 153 (n=39)

Procedure

The raters were asked to assess the clinical version of the NCD instrument, which consisted of 15 items with their item descriptions, and five written care dependency criteria. Before rating, the raters were verbally informed about the background and purpose of the study and the use of the NCD instrument. These training sessions took approximately an hour. The patients were measured three times. Interrater and test-retest reliability were examined for each individual item of the NCD instrument. With each patient, two NCD measurements were done simultaneously by two different raters (T1 and T2). In this manner it was possible to determine the agreement between the two raters. Two weeks after the simultaneous first and second measurements, a third measurement took place in order to determine the test-retest reliability (T3).
These NCD measurements were done by the same patient-rater pair of T1. Data were analyzed using the Statistical Package for Social Sciences [SPSS] (Windows version 6.0.; SPSS, 1993) and AGREE6 software (Poppen, 1995).

Analyses

In this study three aspects of reliability of the NCD instrument were investigated. First, internal consistency was determined using Cronbach's alpha method to estimate reliability at scale level. The second focus in the reliability assessment was on establishing equivalence between observers in rating behavior, which was tested by interrater reliability procedures (Polit & Hungler, 1991).

The third aspect of the NCD scale's reliability was the stability aspect. This was evaluated by test-retest procedures. Both the equivalence and the stability approach focused on estimation of reliability at item level. Coleman (1964) has pointed to two kinds of problems about the reliability of the test-retest method. First, there is the learning effect on the rater, and second there is the possibility of the patient's state of health undergoing changes. To minimize the learning effect, it was decided to carry out the 'retest' measurement two weeks after the first 'test' measurement. The two weeks' choice was based on the assumption that in such a short time no learning effects on the rater would occur. The second problem was solved by determining at the 'retest' measurement whether the patient's state of health had extremely changed or not, taking into account the progress of the disease. As a specific detail of the stability aspect, an investigation was carried out into the difference in reliability between raters who were primary nurses and raters who were team nurses, not directly responsible for making the nursing care plan.

Kappa statistic, an index for agreement for use in nominal scales, is recommended to assess both interrater and test-retest reliability (Cohen, 1960; Heuvelmans & Sanders, 1993). Cohen (1960) defines Kappa (**K**) as 'the proportion of agreement after chance agreement is removed from consideration'. Brennan and Hays (1992) state that where explication of the exact differences between judges' ratings is sought, a weighted Kappa ($\mathbf{K}_\omega$) may be used, and where an omnibus measure of agreement is desired, an unweighted Kappa (**K**) is appropriate.

In this study, both **K** (taking into consideration also chance) and $\mathbf{K}_\omega$ (taking into account the distance between two answers, diminishing the chance part if the answers are widely divergent) were used to calculate the values of the agreement between two raters, and the agreement between the two scores of the same rater (Ljunggren, Fries, & Winblad, 1992). **K** and $\mathbf{K}_\omega$ were calculated by the SPSS software and the AGREE6 software, respectively.

Besides the reliability of an instrument, utility is also a criterion for evaluating a measure. In assessing the NCD scale's utility, the time a rater needs to complete the instrument, and the connection between completion time and the rater's acquaintance with the instrument were investigated.

Second, raters were asked their opinion about the clearness of the instructions on the instrument, and the understandability of its items and its criteria in practice.

Results

Cronbach's alpha was calculated at scale level for each of the three measurements. Cronbach's alpha coefficients for the whole NCD scale were reported as .96 and .95 for the simultaneous first and second measurements (T1 and T2), and .97 for the third measurement (T3). In order to rule out the possibility that the high alpha was caused by the raters' experience with filling in the NCD scale, this relation was investigated further. The data on the first NCD questionnaire were collected from each rater (n=136) for calculating the internal consistency. Thus, learning and memory effects were ruled out. Again, a high alpha of .97 was found, confirming the earlier results. Consequently, the NCD scale has a high alpha coefficient, supporting the internal consistency reliability of the scale. At item level, the interrater reliability (T1 and T2) concerning the separate NCD-items revealed moderate unweighted Kappa statistics between .40 and .65, and weighted Kappa statistics between .51 and .83 (see Table 6). Table 6 also shows a broader range in both unweighted Kappa (.38 - .69 and .39 - .60, respectively) and weighted Kappa (.48 - .85 and .48 - .74, respectively) for the mentally handicapped populations compared with the demented population.

Table 6 Interrater Reliability, Cohen's Kappa (K and K_ω) of the 15 NCD items

	Interrater reliability					
	Institutions of the mentally handicapped		Nursing homes		Total	
Item of nursing-care dependency	(*n*=139) K	K_ω	(*n*=153) K	K_ω	(*n*=292) K	K_ω
Eating and Drinking	.55	.64	.60	.71	.58	.69
Incontinence	.69	.85	.56	.73	.65	.82
Body Posture	.46	.65	.49	.68	.49	.69
Mobility	.66	.84	.58	.79	.64	.83
Day/Night Pattern	.38	.48	.39	.48	.40	.51
Getting (Un)dressed	.55	.75	.52	.67	.56	.76
Body Temperature	.42	.64	.54	.72	.49	.69
Hygiene	.66	.83	.59	.74	.63	.79
Avoidance of Danger	.50	.67	.51	.69	.51	.69
Communication	.52	.71	.42	.68	.47	.69
Contact with Others	.44	.60	.47	.65	.47	.64
Sense of Rules and Values	.42	.62	.47	.67	.47	.67
Daily Activities	.42	.60	.50	.65	.48	.65
Recreational Activities	.56	.71	.42	.56	.52	.66
Learning Ability	.42	.58	.39	.54	.46	.63

As Table 7 shows, the two calculated Kappa values at item level, unweighted and weighted, for the test-retest reliability (T1 and T3) were calculated on a smaller sample (*n*=236). Two Kappa values were determined only for patients whose state of health had not changed between the first and the repeated measurement. For both samples, unweighted Kappas between .55 and .79 were found, indicating a moderate to substantial test-retest reliability. Weighted Kappas gave statistics between .69 and .89 for the total sample. The difference in the two Kappa statistics for both subpopulations are given in Table 7. Again, a broader range was found in both unweighted Kappa (.50 - .81 and .53 - .75, respectively) and weighted Kappa (.61 - .89 and .67 - .86, respectively) for the mentally handicapped populations than for the demented population.

Table 7 Test-retest Reliability, Cohen's Kappa (K and K_ω) of the 15 NCD items

Item of nursing-care dependency	Test-retest reliability: Institutions of the mentally handicapped (n=122) K	K_ω	Nursing homes (n=114) K	K_ω	Total (n=236) K	K_ω
Eating and Drinking	.69	.77	.73	.85	.72	.82
Incontinence	.79	.89	.75	.86	.79	.89
Body Posture	.61	.77	.64	.79	.64	.79
Mobility	.77	.88	.65	.84	.72	.87
Day/Night Pattern	.52	.61	.64	.69	.59	.66
Getting (Un)dressed	.81	.89	.75	.83	.79	.88
Body Temperature	.50	.72	.62	.76	.56	.74
Hygiene	.68	.85	.66	.80	.67	.83
Avoidance of Danger	.58	.76	.70	.79	.64	.78
Communication	.54	.73	.63	.78	.58	.75
Contact with Others	.50	.67	.59	.77	.55	.72
Sense of Rules and Values	.61	.73	.73	.83	.67	.78
Daily Activities	.59	.72	.65	.80	.64	.77
Recreational Activities	.52	.66	.53	.67	.55	.69
Learning Ability	.56	.71	.65	.73	.63	.76

As a specific detail of the stability aspect, an investigation was carried out into the difference in reliability between primary nurses and team nurses, working in both long-term care facilities. Unweighted Kappa statistics were calculated for each of the 15 NCD items (see Table 8). A comparison between primary nurses and team nurses revealed primary nurses had a higher strength of agreement between the two ratings on 12 of the 15 NCD items.

The second aim of the study was to investigate the utility of the NCD scale with regard to time aspects. Because of the differences in the number of rater assessments between the participating institutions (range 6 to 93), it was decided to base the calculations on all NCD data gathered by the individual raters (n=876). First, the time a rater needed to complete the instrument was investigated.

Table 8 Differences in Reliability, Cohen's Kappa (K) Between Primary Nurses and Team Nurses on the 15 NCD items

Item of nursing-care dependency	Test-retest reliability	
	Primary nurse (n=50)	Team nurse (n=86)
Eating and Drinking	.79	.69
Incontinence	.83	.77
Body Posture	.65	.64
Mobility	.77	.70
Day/Night Pattern	.72	.55
Getting (Un)dressed	.90	.76
Body Temperature	.62	.54
Hygiene	.74	.66
Avoidance of Danger	.79	.59
Communication	.50	.58
Contact with Others	.46	.57
Sense of Rules and Values	.63	.68
Daily Activities	.75	.61
Recreational Activities	.61	.53
Learning Ability	.64	.62

The mean time needed to complete the scale was eight minutes (SD=6.1, median=6.0). 70% of the raters (n=613) stated that the scoring took less time than they had expected. Second, (Pearson) correlation was computed to assess the connection between completion time and the rater's acquaintance with the instrument. The more frequently a rater completed a NCD scale, the less time it took (r=-.42, p<.001).

Raters were asked their opinion about the clearness of the instructions on the instrument. After reading the instructions raters reported that they knew exactly what was expected from them in 88% of the NCD assessments (n=770) (see Table 9). A next question, about recognizing the patient's needs in the 15 NCD scale items, revealed the following result. In 40% of the cases (n=353), the patient's care needs were easily recognized in the NCD items, and in 55% of the cases (n=477) they were recognized for the greater part (see Table 9). Finally, raters were asked if they had been able to choose one of the five given criteria in relation to the patient's state of care dependency.

In 65% of the NCD assessments (n=572), raters had made a choice without hesitation, in 30% of the cases (n=265) raters reported that more than once they had hesitated between two or three successive criteria, and in 5% of the assessments (n=39) raters did not know which criterion they should choose (see Table 9).

Table 9 Utility of the NCD scale: % (dis)agreement (number of raters)

	Clear <----------> Unclear		
	1	2	3
1 Filling-in instruction	88 (770)	11 (100)	1 (6)
2 NCD items versus needs recognition	40 (353)	55 (477)	5 (46)
3 Criteria choice	65 (572)	30 (265)	5 (39)

Discussion

The internal consistency of the whole NCD instrument was determined by means of Cronbach's alpha. An internal consistency greater than the required value of .90 means that the scale may be applied on an individual level (Polit & Hungler, 1991). The alpha coefficients (range from .95 to .97) that were found were high enough to use the NCD instrument in clinical practice, both on a group and an individual level.

In order to determine the reliability on item level it was necessary for different raters to interpret the various items of the NCD instrument in the same way. The final score of the NCD items had to be independent of the person assessing the instrument.

To what extent the NCD items were interpreted by different raters at the same point of time was examined by means of the interrater reliability. The reliability (K_ω) of the NCD instrument on item level gave a moderate to substantial interrater reliability. The unweighted Kappa values revealed the same pattern of agreement as weighted Kappa values. Only one item, 'Day/Night Pattern', showed a fair amount of agreement among the raters (see Table 7). Further analysis revealed that differences in nuance in choosing one or two successive criteria were mainly responsible for lower unweighted and weighted Kappa statistics with regard to the NCD instrument.

Differences between two raters can be caused by the patient or the rater (Ljunggren *et al.*, 1992). A patient's state of care dependency can vary over time and it can be difficult for nurses to get current information for all patients on all the care dependency items involved. Nurses can also be more or less experienced in their assessment ability. Therefore, independent of the measurement moment it was decided that the test-retest reliability would be calculated only for those patients that showed no change in their health condition.
Findings indicate that primary nurses were better able to identify care dependency than were team nurses. A likely explanation for this finding is that primary nurses have more direct and intensive contacts with the patient and are able to make a comprehensive assessment of care dependency. The team nurse, on the other hand, has a limited contact with the patient and is not responsible for making the care plan, which is a main source of patient information. Nevertheless, the results of team nurses here were satisfactory.
In this study, both K and K_ω were used to calculate the values of the agreement between two raters, and the agreement between the two scores of the same rater. It appeared that, both in Table 6 and in Table 7, the weighted Kappa compared with the unweighted Kappa not only gave the exact differences between judges' ratings but also a higher value of agreement.
Concerning the usefulness of the instrument in practice, it can be concluded that both the instructions and the criteria to choose from were evaluated as clear and understandable by the raters. The majority of the raters recognized their patients' needs in the 15 NCD items.
Therefore, it can be argued that this new NCD instrument can fulfill the need among nurses for assessing patients' care dependency on the basis of a nursing theory.
In summary, based on the three investigated aspects of reliability in this study and the findings of previous studies on content validity and construct validity, it can be argued that the NCD scale is a valid and reliable instrument for assessing nursing care needs in two specific in-patient categories. Although there is evidence of reliability, validity and utility, further validity studies will be necessary.
Recommendations for further lines of enquiry include tests on criterion-related validity, use and clinical significance of the NCD instrument in daily practice.

5 Construct Validity of the Nursing-Care Dependency Scale

Ate Dijkstra, Girbe Buist, Peter Moorer, Theo Dassen

Abstract

This paper describes the results of a study determining construct validity aspects of the Nursing-Care Dependency (NCD) Scale. This 15 item instrument has been developed recently for the assessment of the care dependency of demented or mentally handicapped in-patients. Data were collected for 450 demented and 203 mentally handicapped patients using the NCD instrument. Factor analysis of the NCD instrument resulted in one Factor. With Mokken scale analysis a H-coefficient of .75 was found, which implied a strong hierarchical scale. The alfa coefficients (.97) were high enough to use the NCD instrument in clinical practice, both at a group and an individual level.

Introduction

This paper describes the results of a study determining construct validity of the Nursing-Care Dependency scale (NCD scale) for use in Dutch psychogeriatric nursing homes and institutions for the mentally handicapped. In the Netherlands there are 70 nursing homes with a capacity of 25600 inpatients beds in which psychogeriatric patients are admitted, usually with some form of dementia. These nursing homes provide long-term treatment which includes activities such as care, treatment and therapy. Psychogeriatric patients are defined as patients with cognitive impairment and/or behavioral problems characterized by a complex interaction of physical, mental, and social factors (Gerritsen *et al.*, 1995; Hogstel, 1995).

For the mentally handicapped people there are 123 institutions with a capacity of 32470 beds.
'Mentally handicapped' is a label for intellectual-cognitive deficits impairing an individual's ability to adapt to the daily-living, social, and work demands of their environment (McFarland & Durand Thomas, 1991; Maaskant, 1993).
These institutions provide day and night services, including care, treatment and training (National Hospitals Council, 1989; Ministry of Welfare, Health and Cultural Affairs, 1992; Ministry of Welfare, Health and Cultural Affairs, 1994).

Background and Instrument Development

In nursing practice in these settings it appeared that nurses made use of instruments which were inadequate for assessing the nursing dimensions of the patient's degree of dependency. Frequently used instruments are the Rating Scale for Elderly Patients (Kam van der *et al*., 1971), the Behavior Observation Scale for Intramural Psychogeriatrics (Verstraten & Van Eekelen, 1987) and the Scale for Social Functioning (Kraijer & Kema, 1994). The lack of a comparable instrument based on nursing theory and geared to these specific patient categories, gave rise to a research project to develop such an instrument. The main aim of the project was to develop an assessment tool that could provide a reliable and validated judgment about the patients' nursing-care dependency. In clinical practice, nurses should use the instrument to measure the patient's degree of care dependency in order to be able to plan individualized nursing care. This new assessment scale conducts a care dependency assessment, and in the later steps of the nursing process item measurement can be used in diagnosing care dependency and in planning interventions to change the state of dependency of the demented or mentally handicapped patient to a greater degree of independence.
In a first study, the concept of nursing-care dependency was operationalized using the approach of Waltz, Strickland and Lenz (1991).

Dictionaries (Collins Dictionary, 1988; Cambridge Dictionary, 1995) and professional literature (Abdellah *et al.*, 1960; Henderson, 1966; Van den Heuvel, 1976; Orem, 1995) were consulted to decide a definition of nursing-care dependency and to determine a framework which would be useful in specifying the variable properties of nursing-care dependency.

Virginia Henderson's theory concept of nursing, and especially her framework of human needs, were used for conceptualizing the nursing-care dependency items (Henderson, 1966).

The NCD instrument measures 15 concepts of human needs: eating and drinking, incontinence, body posture, mobility, day/night pattern, getting dressed and undressed, body temperature, hygiene, avoidance of danger, communication, contact with others, sense of rules and values, daily activities, recreational activities and learning ability (Dijkstra *et al.*, in press[a]). The NCD scale has been psychometrically tested in two studies. Content validity was established by 44 experts in a Delphi survey (Dijkstra *et al.*, 1996b). Reliability was documented (interrater reliability (K_ω): .51 to .83; test-retest reliability (K_ω): .66 to .89; Cronbach's alpha: .97) (Diepenmaat *et al.*, 1994).

Purpose

In this paper attention will be given to determining the construct validity of the NCD instrument. Construct validity is the degree to which an instrument measures the construct under investigation (Polit & Hungler, 1991). The aims of this study were to answer the following research questions:

1 Is the construct validity of the NCD instrument such that it can be used in practice as a scale?
2 What is the relationship between the mean NCD sumscore and demographic characteristics of sex and age?
3 Is the NCD instrument capable of distinguishing and predicting care dependency groups?

The study to be presented was accepted by the management, the participating nurses and, in some cases, by relatives of the patients or ethics committees in the psychogeriatric nursing homes and institutions for the mentally handicapped that participated.

Methods

Sample

The sample was composed of demented and mentally handicapped patients from three psychogeriatric nursing homes (n=233, n=128 and n=89, respectively) and three institutions for the mentally handicapped (n=89, n=61 and n=53, respectively).

Procedure

In order to answer the research question, questionnaires were distributed and completed to assess the nursing-care dependency of patients. In the questionnaire, two versions of questions about care dependency were incorporated. Both versions consisted of 15 care dependency items and a description of each item. The versions differed in the way care dependency was assessed. In the so-called short version of the NCD instrument the degree of care dependency was assessed on a five-point Likert-scale. The so-called long NCD version asked for a judgment of care dependency by selecting one criterion out of five written criteria. Completion of the questionnaire was by nurses directly involved in patient care.

Analysis

The first approach to construct validating the NCD instrument was factor analysis. The factor analysis procedure was used to identify and arrange the measures of the underlying concept of the NCD instrument: care dependency. Because of the theoretical concept two clusters of related items were foreseen, namely somatic and psychosocial factors. Factor loadings were interpreted to find out which items 'belonged' to a factor. Items with a factor loading lower than .40 were eliminated. For practical use of the NCD instrument it was desirable to have a simple calculating method. For this reason, Mokken scale analysis was used in the second approach to construct validating the NCD instrument. Mokken scale analysis defines the scalability of the items and, consequently, of the instrument.

The Mokken scale technique assumes that all necessary information for the analysis is present in the sumscore of the items. A degree of reliability was also computed with Mokken scale analysis.

Results

Construct validity

Before combining both subsamples, factor analysis for each patient group showed almost identic factor loadings on each NCD item.

Further, almost identic Eigenvalues (10.76 and 10.58 for the demented and the mentally handicapped patient group, respectively) and percentage variance (71.73 and 70.56, respectively) were found. Thus both subsamples were combined for further analysis.

Factor extraction using Principal Components was used on both the short and the long NCD-instrument to find the common dimensions in the 15 care dependency items. Factor loadings, Eigenvalues and percentage of variance for the 15 NCD items are shown in Table 10. The Eigenvalue for a factor is the amount of variation in the NCD data 'explained' by that factor. Factor loadings express the strength of association between each of the NCD items on the one hand and the identified underlying factor (i.e. dimension of care dependency) on the other. From a theoretical point of view it was expected to distinguish two factors in the factor analysis, namely a somatic and a psychosocial cluster of items. As Table 10 illustrates, Factor 1 has the highest Eigenvalue for both versions of the NCD instrument, 10.35 (short) and 10.72 (long) respectively. Factor extraction demonstrated that all 15 items fell in Factor 1. As none of the items had a factor loading lower than .40, no item reduction took place.

Table 11 shows the mean score and standard deviations of the NCD items in the short and long NCD instrument. Correlations were computed between the items of both versions of the NCD instrument. The mean sumscore and standard deviations in both versions of the NCD instrument appeared to be hardly different, 40.09 (*SD*=18.45) and 39.74 (*SD*=17.84), respectively.

Table 10 Factor loadings, Eigenvalue and % variance of the short and long NCD-scale for the total population (n=653)

NCD-items	Short NCD-scale		Long NCD-scale	
	Factor 1	Factor 2	Factor 1	Factor 2
Eating and Drinking	.80	.03	.86	.04
Incontinence	.82	.30	.84	.26
Body Posture	.81	.36	.79	.44
Mobility	.71	.56	.71	.60
Day/Night Pattern	.70	.14	.75	.05
Getting (Un)dressed	.86	.25	.89	.16
Body Temperature	.88	-.03	.90	-.10
Hygiene	.91	-.08	.92	-.06
Avoidance of Danger	.89	-.06	.90	-.07
Communication	.79	-.31	.77	-.28
Contact with Others	.82	-.36	.84	-.32
Sense of Rules and Values	.88	-.24	.89	-.23
Daily Activities	.87	-.20	.89	-.17
Recreational Activities	.86	-.15	.87	-.18
Learning Ability	.84	-.09	.84	-.03
Eigenvalue	10.35	.98	10.72	.97
% variance	69.0%	6.6%	71.5%	6.5%

High correlations were found between both the items and the sumscores of both versions of the NCD instrument.

The Mokken model assumes two necessary conditions for ordering n persons and k dichotomous items on a measurement scale, which are called monotone homogeneity and double monotonicity (Mokken 1971, Molenaar *et al.*, 1994, Sijtsma *et al.*, 1990).

The first condition is that 'for each item the persons are ordered in the same way' and the second condition is that 'for each person the items are ordered in the same way' (Swanborn 1982). If the first condition is satisfied, the persons can be ordered, and if the second condition is satisfied, the items can be ordered. For practical application of a scale, especially the first condition is of vital importance (Meijer *et al.*, 1990). The Mokken model program offers an opportunity to search for items which are a unidimensional scale. There is no need to specify which items belong to which scale. For both the separate items (H_i) and the scale as a whole (H) scalability coefficients can be computed.

Table 11 Means, standard deviations and correlation between the short and long NCD-scale for the total population (n=653).

NCD-items	Short NCD-scale		Long NCD-scale		
	$\bar{x}$	*SD*	$\bar{x}$	*SD*	*r*
Eating and Drinking	3.09	1.47	2.75	1.28	.79
Incontinence	2.85	1.68	2.83	1.68	.93
Body Posture	3.24	1.54	3.24	1.46	.86
Mobility	3.38	1.70	3.30	1.69	.93
Day/Night Pattern	3.39	1.47	3.27	1.36	.73
Getting (Un)dressed	2.63	1.57	2.51	1.55	.94
Body Temperature	2.65	1.62	2.63	1.40	.86
Hygiene	2.14	1.38	2.28	1.31	.91
Avoidance of Danger	2.32	1.43	2.34	1.42	.88
Communication	3.04	1.47	3.16	1.43	.85
Contact with Others	2.62	1.46	2.40	1.29	.85
Sense of Rules and Values	2.32	1.44	2.34	1.47	.86
Daily Activities	2.18	1.42	2.28	1.37	.85
Recreational Activities	2.18	1.43	2.26	1.33	.83
Learning Ability	2.07	1.22	2.16	1.16	.82
Sumscore	40.09	18.45	39.74	17.84	.97

According to Mokken the following rules of thumb can be used for interpretation of the item coefficient H_i or the overall scalability coefficient H: the items are weak or form a weak scale in case of $.30 \leq H_i$ (or H)$<.40$, a medium item or scale exists in case of $.40 \leq H_i$(or H)$<.50$ and a strong item or scale if H_i, respectively $H \geq .50$. Table 12 shows that all items of both the short and the long NCD instrument fit excellently into the scale.
For the total population, and for both the short and the long version of the NCD instrument, the H-coefficient amounted to .70 and .75 respectively, which implied a strong scale.

Reliability

Within the Mokken model degree of reliability was computed (ρ). However, this Rho could only be used if both conditions of the Mokken model were met. Since the condition of double monotonicity was not met, a reliability analysis was executed.
Cronbach's alpha coefficients were computed for all items of the short and the long NCD instrument.

Table 12 Mokken-scale analysis (H_i and H) of the short and long NCD-scale for the total and separate populations.

NCD-items (H_i)	Total (n=653)		Nursing homes (n=450)		Inst. for the mentally handicapped (n=203)	
	NCD-scale:		NCD-scale:		NCD-scale:	
	short	long	short	long	short	long
Eating and Drinking	.69	.76	.69	.76	.70	.78
Incontinence	.70	.73	.68	.72	.69	.77
Body Posture	.71	.70	.71	.71	.69	.67
Mobility	.66	.66	.64	.64	.64	.67
Day/Night Pattern	.63	.67	.60	.65	.66	.69
Getting (Un)dressed	.73	.78	.74	.80	.66	.77
Body Temperature	.74	.79	.75	.80	.72	.79
Hygiene	.80	.81	.80	.93	.78	.81
Avoidance of Danger	.77	.79	.77	.79	.75	.79
Communication	.67	.68	.70	.74	.62	.75
Contact with Others	.69	.74	.72	.77	.64	.75
Sense of Rules and Values	.75	.78	.75	.79	.73	.78
Daily Activities	.76	.77	.78	.79	.70	.75
Recreational Activities	.75	.76	.74	.75	.74	.77
Learning Ability	.73	.73	.72	.75	.70	.74
Scale coefficient (H)	.72	.74	.72	.75	.70	.75

Both the short and the long NCD instrument showed an internal consistency of .97 (n=653). For both versions this points to a strong degree of internal consistency.

Sex and age

The effect of sex on the performance of the mean NCD sumscore has been investigated by using the Student's t-test. The sex variable of only one nursing home was known (Male: n=45; Female: n=183). No significant differences were found between the NCD sumscore of male and female (see table 13).

As can been seen from Table 13, no significant correlations were found between age and the mean NCD sumscores in the demented patient group as well as in the mentally handicapped patient group.

Table 13 NCD sumscore of patients participating in the study grouped according to their sex and age (*M(SD)*)

Sex	**NCD-sumscore (M(*SD*))**		***t*-test**
Nursing homes	Male (*n*=45)	Female (*n*=183)	
	40.3 (15.3)	37.4 (17.5)	.26
Age	**NCD-sumscore**	**Age**	***r***
Nursing homes (*n*=450)	36.5(17.0)	83.5(7.3)	-.12*
Institutions for the mentally handicapped (*n*=202)	46.9(17.7)	37.9(11.3)	.07

* *p*= 05 (2-tailed)

Table 14 Sumscore and itemscore on the NCD-scale, divided about five groups indicating patients' NCD ($\bar{x}$ (*SD*))

	Care Dependency Groups					
	1(*n*=191)	**2(*n*=204)**	**3(*n*=131)**	**4(*n*=86)**	**5(*n*=41)**	**Kendall's**
	dependent<----------->independent					**Tau-b**
NCD-sumscore*):	21.2(6.5)	34.8(9.2)	50.3(9.4)	62.9(6.9)	68.9(3.9)	
NCD-itemscore**):						
Eating and Drinking	1.6(.7)	2.5(.9)	3.3(1.0)	4.1(.7)	4.7(.5)	.69
Incontinence	1.3(.8)	2.5(1.4)	4.0(1.2)	4.5(.9)	4.7(.9)	.65
Body Posture	1.9(1.1)	3.1(1.2)	4.1(1.0)	4.6(.7)	4.9(.3)	.63
Mobility	1.8(1.4)	3.3(1.6)	4.2(1.1)	4.5(.9)	4.9(.5)	.54
Day/Night Pattern	2.2(1.2)	3.1(1.1)	3.9(1.0)	4.6(.6)	4.8(.6)	.58
Getting (Un)dressed	1.2(.6)	2.0(1.2)	3.5(1.0)	4.3(.9)	4.8(.5)	.71
Body Temperature	1.4(.7)	2.2(.8)	3.2(1.1)	4.4(.7)	4.9(.2)	.72
Hygiene	1.2(.4)	1.8(.8)	2.9(1.0)	4.0(.7)	4.5(.5)	.75
Avoidance of Danger	1.1(.4)	1.9(1.0)	3.0(1.1)	4.1(.8)	4.6(.6)	.72
Communication	1.8(.9)	3.2(1.2)	3.8(1.0)	4.5(.7)	4.8(.5)	.62
Contact with Others	1.3(.5)	2.1(.9)	2.9(1.0)	3.9(1.0)	4.3(.8)	.68
Sense of Rules /Values	1.1(.4)	1.9(1.2)	3.0(1.2)	4.1(.8)	4.6(.5)	.70
Daily Activities	1.2(.5)	1.8(.9)	3.0(1.1)	3.9(.8)	4.4(.8)	.70
Recreational Activities	1.2(.4)	1.8(.9)	2.9(1.0)	3.9(.9)	4.2(.9)	.69
Learning Ability	1.2(.5)	1.9(.8)	2.7(.9)	3.4(1.0)	3.9(.8)	.65

*) sumscores *F*=.0001, Scheffé (α=.05)

**) all items *p*<.0001, Kruskas-Wallis test

Group classification

To investigate the group classification of the NCD instrument, the raters were asked to indicate on a 5-point Likert-scale the patients' degree of care dependency. The NCD instrument seems to purposefully distinguish the five patient groups (see Table 14). For each of the NCD items the Kruskal-Wallis test showed group means which differed significantly from each other (α=.05). The Kendall coefficient of correlations also accepted substantial to high values for each of the NCD items (range: -.54 to -.75). Group classification was further examined by means of discriminant analysis.
The following results were found for the degree to which the NCD sumscore gave a correct group classification in individual cases, for both the demented and the mentally handicapped patients.
In 71% of cases NCD sumscores predicted the classification of the group of 451 demented patients in one of the five care dependency group correctly. The corresponding percentage for the group of 202 mentally handicapped patients was 60%.

Discussion

All items of the NCD instrument contributed to determining patients' care dependency. For this, the degree of internal consistency was determined. An internal consistency greater than the required value of .90 means that the scale may be applied on an individual level (Polit & Hungler 1991). The high alpha coefficients (.97) were high enough to use both the short and long NCD instrument in clinical practice, both at group and individual level.
Factor analysis of the NCD instrument revealed only one factor. Theoretically expected clusters of somatic and psychosocial items could not clearly be distinguished. Therefore no somatic and psychosocial subscales could be constructed. The result obtained supports the holistic approach of nurse theorists that somatic and psychosocial needs are inseparable (Henderson 1966, Levine 1971, Neuman 1989). All 15 needs could be considered as a whole, providing a holistic and unified framework for the NCD instrument. The high loadings of items in the factor analysis indicated that all 15 items have a positive orientation towards the nursing-care dependency concept.

For both versions of the NCD instrument it further appeared from factor analysis that a number of correlations between special items have been underrated. Analyses showed that there are substantial residual correlations between the items 'Body Posture' and 'Mobility', the items 'Communication' and 'Contact with Others' and between the items 'Daily Activities' and 'Recreational Activities'. The correlations between these items cannot be explained by the nursing-care dependency concept. This means that other effects also influence the items.

The residual correlations between these items may be the result of direct memory effects and/or conditional dependence between the items.

The high factor loadings confirmed that all items were affected by the nursing-care dependency concept.

To reduce both possible direct memory effects and conditional independence, it is proposed to change the sequence in the instrument of items 4, 11 and 14, and also to change the item description of item 4 from 'Mobility' to 'Physical Mobility'.

Mokken scale analysis gave H-coefficients from .70 to .75.

This means a strong hierarchical scale (Mokken 1971). The separate NCD item scores may therefore be summed. In addition, it is statistically acceptable that patients with both an identical sumscore and the same items are equally dependent on care. Beside the scalability of the items it was also determined whether the items transgressed the conditions of monotone homogeneity and double monotonicity. The check of monotone homogeneity, ordering the persons, gave no violations. Thus this condition was not transgressed. However, the check of double monotonicity, that is, the property that with two item step characteristic curves do not intersect, showed a number of violations. This second condition was transgressed, especially by a number of items in the research population of demented patients. In general, this means that the items could not be arranged with respect to each other. A reason for these violations could be direct memory effects, as noted earlier. Of importance was the conclusion that more violations were found regarding the sample of demented patients. This may be explained by the spread of competence among the respondents from the psychogeriatric nursing homes. Another explanation could be that the research was better introduced in the institutions for the mentally handicapped.

The second research question concerned the influence of sex and age on the NCD sumscore. No significant relationship was found between sex and care dependency in demented patients. However, the result relating to sex was restricted by the nature of the sample. Another explanation may be found in the sample selection, which was based on care dependency and not on sex. Therefore this finding was difficult to interpret.

Relating to age, from the findings on the demented and the mentally handicapped patients presented in Table 13 no statistically significant correlations regarding age and care dependency emerged.

These findings highlighted clearly that age exerts no influence on care dependency of demented and mentally handicapped patients.

Finally, the group classification of the NCD instrument was investigated.

As Table 14 illustrates, it was possible to give an adequate classification of care dependency groups for demented and mentally handicapped patients by means of the NCD instrument. The predicted group membership was higher for the demented patients' group (71%) than for the group of mentally handicapped patients (60%). Closer investigation showed, for both patient groups, that low predicted values emerged, especially for the care dependency groups 2, 3 and 4 (demented group: range 52% to 63%, mentally handicapped group: 50% to 55%).

When the number of care dependency groups was reduced to three by combining the original groups 1 with 2, and 3 with 4 the predicted group membership increased to 85% for the demented patients and to 72% for the mentally handicapped patients.

Conclusion

The study presented here has confirmed some aspects of the construct validity of the NCD instrument. In general, the condition was made that the instrument could only be used in practice if the results of factor analysis and Mokken scale analysis were satisfactory. The psychometric attributes of the NCD instrument that have been found in this study are such that it is justifiable to speak of an NCD scale.

Construct validity in this study was analysed by factor analysis and Mokken scale analysis.
The individual items represent one dimension of care dependency.
Two versions of the NCD scale were validated. The results of the analysis techniques that were used showed a corresponding result for both scales. The so-called short NCD scale is intended to be used for those situations in which an approximate assessment of care dependency will be sufficient or for scientific research.
Because of the more detailed information about the patients' state of care dependency given by the so-called long NCD scale, this version will be used for routine assessments and diagnosis within the framework of the nursing process.
Before the NCD scale can be applied in nursing practices in psychogeriatric nursing homes and institutions for the mentally handicapped, further validity studies will be necessary.
Recommendations for further lines of enquiry include tests on use, clinical significance and criterion-related validity.
With regard to the latter, it is suggested criterion-related validity should be investigated by exploring the relationship between the NCD scale and two frequently used instruments in Dutch nursing homes (the Rating Scale for Elderly Patients and the Behavioural Observation Scale for the Intramural Psychogeriatric Patient) and between the NCD scale and the Scale for Social Functioning, which is used in most Dutch institutions for the mentally handicapped.
English, Norwegian, and Italian versions of the Dutch NCD-scale have been developed and are available.

6 A Criterion-related Validity Study of the Nursing-Care Dependency Scale

Ate Dijkstra, Girbe Buist, Theo Dassen

Abstract

The purpose of this study was to examine some aspects of the criterion-related validity of the Nursing-Care Dependency (NCD) scale. This 15-item counting scale has recently been developed for assessing the care dependency of demented or mentally handicapped in-patients. Its criterion-related validity was investigated by studying the relationship between the Nursing-Care Dependency scale, the Rating Scale for Elderly Patients (RSEP), the Behavior Observation Scale for Intramural Psychogeriatrics (BOSIP) and the Scale for Social Functioning (SSF). Data were collected from 322 demented and 105 mentally handicapped patients using the mentioned instruments. High correlations were found between NCD and RSEP, and NCD and SSF. There was a low relationship between the NCD sumscore and BOSIP subscales-scores. The NCD was able to purposefully distinguish diagnostic groups of demented patients when an external criterion was used.

Introduction

This paper describes the results of a study determining criterion-related validity of the Nursing-Care Dependency scale (NCD scale) for use in Dutch psychogeriatric nursing homes and institutions for the mentally handicapped. In the Netherlands there are 70 nursing homes with a capacity of 25600 inpatients beds in which psychogeriatric patients are admitted, usually with some form of dementia. These nursing homes provide long-term treatment which includes activities, such as care, treatment and therapy.

For the mentally handicapped people there are 123 institutions with a capacity of 32.470 beds.
These institutions provide day and night services, including care, treatment and training (National Hospitals Council, 1989; Ministry of Welfare, Health and Cultural Affairs, 1992; Ministry of Welfare, Health and Cultural Affairs, 1994).
In the nursing practice of these settings it appeared that nurses made use of instruments which were inadequate for assessing the nursing dimensions of the patient's degree of dependency. Frequently used instruments are the Rating Scale for Elderly Patients (RSEP), the Behavior Observation Scale for Intramural Psychogeriatrics (BOSIP) and the Scale for Social Functioning (SSF). The lack of a comparable instrument based on nursing theory and geared to these specific patient categories, gave rise to a research project to develop such an instrument. The main aim of this project was to develop an assessment tool that could provide a reliable and validated judgment about the patients' nursing-care dependency. In clinical practice, nurses should use the instrument to measure the patients' degree of care dependency in order to be able to plan individualized nursing care. This new assessment scale conducts a care dependency assessment, and in the further steps of the nursing process the item measurement can be used in diagnosing care dependency and in planning interventions to change the state of dependency of the demented or mentally handicapped patient into a greater degree of independence. Virginia Henderson's theory concept on nursing, and especially her framework of human needs, were used for the conceptualizing of the nursing-care dependency items (Henderson, 1966).
The Nursing-Care Dependency scale provides a framework for the care dependency status of demented elderly or mentally handicapped in-patients. The NCD scale measures 15 concepts of human needs: eating and drinking, incontinence, body posture, mobility, day/night pattern, getting dressed and undressed, body temperature, hygiene, avoidance of danger, communication, contact with others, sense of rules and values, daily activities, recreational activities and learning ability.
The NCD scale has been psychometrically tested in three studies. Content validity was established by 44 experts in a Delphi survey (Dijkstra, Buist, & Dassen, 1996b).

Reliability was documented (interrater reliability (K_ω): .51 to .83; test-retest reliability (K_ω): .66 to .89; Cronbach's alpha: .97) (Diepenmaat, Hovius-Dragt, & Zuidersma, 1994). Factor analysis was carried out and resulted in a one-factor solution (Eigenvalue 10.721).
In addition, Mokken scale analysis resulted for the whole scale in a high H-coefficient .75 (Dijkstra, Buist, & Dassen, 1996a; Dijkstra, Buist, & Dassen, submitted).

Criterion-related validity

An important part of validity assessment is determining the criterion-related validity, in which emphasis is put on establishing the relationship between the target instrument and some other criteria. The target instrument is said to be valid if its scores correlate highly with those criteria (Polit & Hungler, 1991). According to Polit & Hungler (1991) the essential component of the criterion-related approach to validation is the availability of a reasonably reliable and valid criterion with which the measures on the NCD scale can be compared.
Three such instruments are administered in this study, namely, the Rating Scale for Elderly Patients (RSEP) (Van der Kam, Mol, & Wimmers, 1971), the Behavior Observation Scale for Intramural Psychogeriatrics (BOSIP) (Verstraten & Van Eekelen, 1987), and the Scale for Social Functioning (SSF) (Kraijer & Kema, 1972). The first two instruments are frequently used in Dutch psychogeriatric nursing homes, the third is used as measurement instrument in most Dutch institutions for the mentally handicapped.
In general, great importance will be attached to the results of psychometric research in developing a measurement instrument for use in practice. As to the psychometric testing of the three instruments, mentioned above, reliability and validity of the RSEP, as opposed to the BOSIP, were frequently investigated and described in literature (Diesfeldt, 1981; Melchior, 1992/93). The reliability and validity of the SSF were tested and described in various studies (Blok, 1989; Hoefnagel, 1989; Kraijer, 1987; Kraijer & Kema, 1972; Kraijer & Kema, 1981).

Regarding the psychometric testing of the NCD scale, accounts has been given of its content validity, reliability and construct validity (Diepenmaat, Hovius-Dragt, & Zuidersma, 1994; Dijkstra, Buist, & Dassen, 1996a; Dijkstra, Buist, & Dassen, 1996b; Dijkstra, Buist, & Dassen, submitted).

Hypotheses and research questions

Two hypotheses were formulated to investigate the criterion-related validity of the NCD scale and the three other measurements scales.

Hypothesis 1: *Correlations will be strong (>.60) between the Nursing-Care Dependency scale on the one hand and 4 subscales of the Rating Scale for Elderly Patients (Helplessness, Mental Disability, Physical Disability, Inactivity) and the Scale for Social Functioning on the other.* The subscales of the Rating Scale for Elderly Patients and the Scale for Social Functioning measure the patient's activities and his taking initiatives and collect many symptoms of impaired behavior also related with the Nursing-Care Dependency items. The criterion-related NCD validity will be supported if correlations are higher than .60.

Hypothesis 2: *Correlations will be low (<.60) between the Nursing-Care Dependency scale on the one hand and 2 subscales of the Rating Scale for Elderly Patients (Aggressivity and Depressive Behavior) and the Behavior Observation Scale for Intramural Psychogeriatrics on the other.* This hypothesis was based on the assumption that the subscales of both instruments do not support the concept of nursing-care dependency. The criterion-related validity will not be supported if correlations are lower than .60. On account of the measurement pretension of the subscales of the BOSIP instrument, alternating strong and low correlations with the NCD scale can be expected.

Finally, the discriminant power of the NCD scale, for assessing care dependency of demented in-patients, was investigated along two lines. First, the differentiating power of the NCD scale was investigated from the following research question: *Is the NCD scale (sumscore) able to classify demented patient groups in the same way as the RSEP and the BOSIP are?* Secondly, another research question was formulated to investigate the discriminant power of the NCD scale: *How many demented patients in patient groups are correctly predicted by the NCD scale (sumscore)?*

For both research questions, the classification of demented patient groups was based on the 'Dutch Nieuw Toutenburg classification', which represents three categories: 'aged people requiring nursing guidance', 'aged people requiring nursing care' and 'aged people requiring intensive nursing care' (Sipsma, 1970; Wimmers, 1976). This classification is a very useful working-model that is frequently used in the care of demented in-patients in the Netherlands.

Method

A correlational design was employed to determine whether any relationships existed between the NCD scale and three other instruments: RSEP, BOSIP and SSF. The study to be presented here was accepted by the management, the participating nurses and, in some cases, by the relatives or ethics committee in the psychogeriatric nursing homes and institutions for the mentally handicapped that participated.

Sample

The settings in this study comprised two psychogeriatric nursing homes and three institutions for the mentally handicapped. In order to examine the research questions and hypotheses, two research samples were composed. The first sample included all psychogeriatric patients of two nursing homes (n=322). The second sample consisted of 105 patients from three institutions for the mentally handicapped for whom the SSF scale was available. For each sample, patients' characteristics and the instruments used are illustrated in Table 15.

Table 15 Patients' ages and instruments used

	Nursing homes		Institutions for the mentally handicapped
	A (n=233)	B (n=89)	C (n=105)
Age: - mean	84.5	84.3	40.1
- standard deviation	7.2	7.1	11.7
- range	64-10	161-99	15-64
Instruments:	NCD RSEP	NCD BOSIP	NCD SSF

Data collection

For both research populations nurses were asked to measure their patients' care dependency by assessing the NCD scale.
The scale consists of 15 care dependency items, each of which has an item description, and 5 care dependency criteria.
For an example see Figure 7.
Besides, either the Rating Scale for Elderly Patients or the Behavior Observation Scale for Intramural Psychogeriatrics or the Scale for Social Functioning was filled in, depending on which one was normally used in the nursing homes or institutions for the mentally handicapped concerned. The completion of both instruments took place by nurses directly involved in the patients' care.

Figure 7 Example of an Item with its Item Description and Item Criteria

Item	Hygiene
Item description	The extent to which the resident is able to take care of his/her personal hygiene unaided
Item criteria	(1) Patient is unable to assure his/her personal hygiene, e.g., bathing, brushing his/her teeth, combing his/her hair, etc., unaided (2) Patient is somewhat able to contribute to his/her personal hygiene, but does not do so on his/her own initiative (3) Patient is able to perform several actions regarding his/her personal hygiene unaided, but supervision and aid are required (4) Patient is able to perform most actions regarding his/her personal hygiene unaided, but some supervision and aid are still required (5) Patient is able to take care of his/her personal hygiene completely unaided

Instrumentation

1 The Rating Scale for Elderly Patients is a Dutch version of the Stockton Geriatric Rating Scale (SGRS) (Meer & Baker, 1966; Van der Kam, Mol, & Wimmers, 1971). The Rating Scale for Elderly Patients contains 35 aspects of patients' daily behavior.
Six subscales were constructed: helplessness, aggressivity, mental disability, depressive behavior, physical disability, inactivity. The nurse assesses the severity of impairment of each item on a three-point rating scale.
The Rating Scale for Elderly Patients was psychometrically tested in a great number of studies (Diesfeldt, 1981).
In the original study, in which the SGRS was modified and developed into the Rating Scale for Elderly Patients and 965 patients were involved, an account was given of construct validity (factor analysis and discriminant validity) and reliability research (Van der Kam, Mol, & Wimmers, 1971). Factor analysis resulted in constructing 6 subscales. Internal consistency of the subscales (.74 to .94) and the inter-rater reliability (.74) were adequate on the whole.
Results of the investigation into the differentiating power of the scale prove there is a case for use of the subscale 'helplessness' in classifying demented patient groups.

2 The (Dutch) Behavior Observation Scale for Intramural Psychogeriatrics was developed because of a great need for a reliable and valid assessment instrument in the field of intramural psychogeriatrics (Verstraten, 1988). The aim of developing the scale was to develop a kind of library of separated subscales with a limited number of items. These subscales for each behavior type should cover a well-restricted area of psychogeriatric behavior. The constructed scale contains 82 items divided among 14 subscales, with an average of about 6 items in each scale. The 14 selected scales concern the following: nonsocial behavior, apathetic behavior, distorted consciousness, loss of decorum, rebellious behavior, incoherent behavior, distorted memory, disoriented behavior, senseless repetitive behavior, restless behavior, suspicious behavior, melancholic or sorrowful behavior, dependent behavior, anxious behavior.
The Behavior Observation Scale for Intramural Psychogeriatrics was developed on the basis of a review of the relevant literature and in consultation with psychologists in clinical practice. The scale is filled in by ward personnel, because they are in daily contact with the patients and therefore the best judges of the behavior of the patients in everyday situations (Verstraten & Van Eekelen, 1987; Verstraten, 1988). The scalability of the scales was tested by Rasch analyses. The items constitute Rasch homogeneous scales. Cronbach's alpha, calculated as a coefficient of internal consistency, ranged from .61 to .90. Generally, the interrater reliability gave acceptable correlations from .65 to .90. Some subscales had an interrater reliability lower than desired. The lowest value applied to the subscale 'anxious behavior': .53 (Verstraten & Van Eekelen, 1987; Verstraten, 1988). Melchior, Frederiks, & Halfens (1992/ 1993) found only little further research into the validity and the reliability of the Behavior Observation Scale for Intramural Psychogeriatrics.
3 The Scale for Social Functioning is a Dutch version of the Cain-Levine Social Competency Scale (Cain, Levine, & Elzey, 1963; Kraijer & Kema, 1972). The Scale for Social Functioning measures social functioning in the lower functioning, the profoundly/severely, the severely, and the moderately mentally handicapped in-patients. The scale contains 31 items, divided among four subscales: self help, use of language, doing tasks and social skills. The scale must be filled in by at least two instructed raters by common consent.

Factor analysis (n=2602) resulted in 31 items and 4 subscales. The intrarater and interrater reliability were found to be satisfactory for the scores on both the subscales 'self help' (r=.95 and r=.91 respectively) and 'use of language' (r=.97 and r=.87 respectively). The internal consistency (KR-20) gave high values (from .79 to .97). Criterion-related validity was also investigated and was found to be sufficient (Blok, 1989). The discriminant validity was tested in a number of investigations. The low correlations between the SSF full scale score and the other tested scales affirm the discriminant validity (Kraijer, 1981; Kraijer, 1987).

Results

Criterion related validity

In order to examine hypothesis 1, Pearson correlation coefficient, r, was used to test the relationship between the Nursing-Care Dependency sumscore and the relevant subscales of the Rating Scale for Elderly Patients and the Scale for Social Functioning (see Table 16). In addition, for each scale and subscale mean, standard deviation, number of (sub)scale items, and reliability (Chronbach's alpha) were given.

The Nursing-Care Dependency sumscore correlated moderately to high with four subscales of the Rating Scale for Elderly Patients: helplessness, physical disability, mental disability and inactivity (r ranged from -.75 to -.93).

Significant relationships were found between the NCD sumscore and all SSF subscale scores (r ranged from .68 to .90). As a result, hypothesis 1 supported the criterion-related validity of the NCD scale.

To examine hypothesis 2, the relationship between the NCD sumscore and all BOSIP scale scores, and between the NCD sumscore and two RSEP scale scores was determined by using Pearson correlation coefficient, r. Ten BOSIP subscales correlated slightly to averagely with the NCD sumscore (see Table 16).

Table 16 Means, scale items, reliability, and Pearson-correlations between NCD sumscores, on the one hand, and RSEP subscale scores (n=233), SSF subscale scores (n=105), and BOSIP subscale scores (n=89), on the other hand

	$\bar{x}$ (*SD*)	scale items	α	*r*
NCD sumscore:	34.8(17.4)	15	.96	-
BOSIP subscale scores:				
Nonsocial behavior	12.5(6.1)	8	.90	-.74**
Apathetic behavior	10.0(4.0)	6	.80	-.58**
Distorted consciousness	6.3(4.9)	7	.89	-.74**
Loss of decorum	6.0(3.9)	5	.79	-.35**
Rebellious behavior	5.4(2.9)	5	.64	-.35**
Incoherent behavior	4.5(3.4)	5	.69	-.80**
Distorted memory	12.4(5.3)	7	.87	-.29**
Disoriented behavior	4.7(3.1)	5	.70	-.48**
Senseless repetitive behavior	3.9(3.8)	5	.72	.25*
Restless behavior	3.7(3.0)	5	.66	-.20
Suspicious behavior	2.5(3.8)	7	.84	.25*
Melancholic/sorrowful behavior	3.5(3.3)	6	.81	-.07
Dependent behavior	3.8(3.1)	5	.61	.12
Anxious behavior	2.7(3.8)	6	.84	-.19
NCD sumscore:	32.6(17.4)	15	.96	-
RSEP subscale scores:				
Helplessness	22.6(10.4)	23	.92	-.93**
Aggressivity	2.9(2.7)	5	.81	-.05
Mental Disability	3.0(1.9)	3	.73	-.82**
Depressive Behavior	2.2(1.5)	3	.57	.13
Physical Disability	4.0(2.2)	4	.77	-.75**
Inactivity	9.2(3.5)	7	.87	-.83**
NCD sumscore:	43.1(16.1)	15	.96	-
SSF subscale scores:				
Self Help	27.0(12.9)	12	.96	.90**
Use of Language	18.1(9.6)	9	.98	.75**
Doing Tasks	9.7(5.3)	5	.89	.72**
Social Skills	8.6(4.0)	5	.75	.68**

* p=.05 (2-tailed); ** p=.01 (2-tailed)

Four remaining BOSIP subscales showed substantial coefficients ranging between r=-.66 to r=-.80. As table 16 demonstrates, no significant relationship was found between the NCD sumscore and two RSEP subscales: aggressivity and depressive behavior (r ranged from -.05 to .13). Generally, the results supported hypothesis 2.

Differentiating power

In order to test the two research questions related to the differentiating power of the NCD scale, data from the two nursing homes (n=233 and n=89, respectively) were used. First, data were analysed to determine if the NCD scale classifies demented patient groups in the same way as the RSEP does. Therefore, by means of a described formula the BOSIP data of one nursing home (n=89) were converted into an RSEP-helplessness score (De Jonghe, Kat, & de Reus, 1994). Group classification, used in (Dutch) nursing homes, is normally based on the RSEP-helplessness score, which generates three patient categories. On account of the RSEP-helplessness score, the data were divided among three patient groups: (1) aged people requiring nursing guidance (scale score: 0-16), (2) aged people requiring nursing care (scale score: 17-30), and (3) aged people requiring intensive nursing care (scale score: 31 and higher).
The NCD items were tested for the mean differences between the three groups (Kruskal-Wallis); besides, the rank-order correlation coefficients (Kendall's Tau) were computed (see Table 17).
By means of the second research question it was examined how many demented patients in the three mentioned patient groups were correctly predicted by the NCD scale.

Table 17 Mean NCD-item scores regarding group membership according to RSEP-subscale: Helplessness (n=233), and converted BOSIP subscale variables (n=89)

	Group membership			
	1(n=82) $\bar{x}$ (SD)	2(n=163) $\bar{x}$ (SD)	3(n=77) $\bar{x}$ (SD)	τ
NCD-items*):				
Eating and Drinking	4.2(0.9)	2.4(1.0)	1.7(0.9)	-.62
Incontinence	4.3(1.1)	2.1(1.3)	1.4(0.9)	-.56
Body Posture	4.5(0.8)	2.8(1.3)	1.9(1.1)	-.55
Mobility	4.2(1.1)	2.7(1.5)	1.8(1.3)	-.46
Day/Night Pattern	4.4(0.9)	2.7(1.1)	2.0(1.2)	-.55
Getting (Un)dressed	4.0(1.1)	1.7(0.9)	1.1(0.6)	-.65
Body Temperature	4.2(1.0)	2.1(0.8)	1.6(0.9)	-.65
Hygiene	3.8(1.0)	1.8(0.7)	1.3(0.6)	-.64
Avoidance of Danger	4.0(1.0)	1.7(1.0)	1.2(0.6)	-.65
Communication	4.6(0.6)	3.2(1.2)	1.9(1.1)	-.62
Contact with Others	3.9(1.0)	2.1(0.9)	1.4(0.7)	-.63
Sense of Rules /Values	4.2(1.0)	1.7(1.1)	1.2(0.6)	-.64
Daily Activities	3.6(1.1)	1.6(0.9)	1.1(0.5)	-.63
Recreational Activities	3.5(1.2)	1.7(0.8)	1.2(0.5)	-.59
Learning Ability	3.1(1.1)	1.6(0.7)	1.2(0.5)	-.58
NCD-sumscore**)	60.5(10.0)	31.9(10.0)	21.9(8.8)	
Subscale**):				
RSEP-Helplessness	9.7(4.3)	24.1(4.2)	34.0(5.3)	
BOSIP-Dependency	8.0(3.8)	23.6(3.7)	32.8(4.8)	

*) Kruskal-Wallis on all items p<.0001
**) Scheffé α=.05, F=.0001

Discriminant analysis was used. For the patient group (N=322) investigated her 72,4% were classified correctly by the NCD scale. As table 18 illustrates, 87% of the actual group of 'aged people requiring nursing guidance' (n=82) had been classified in the right group. For both other actual groups, the 'aged people requiring nursing care' (n=163) and the 'aged people requiring intensive nursing care' (n=77), the NCD scale gave a correct prediction of 60% and 84%, respectively.

Table 18 Discriminant analysis of group membership based on performance on NCD sumscore

Actual Group Membership	Predicted Group Membership 1	2	3
1 82(100%)	**71 (87%)**	11 (13%)	0 (0%)
2 163(100%)	14 (9%)	**97 (60%)**	52 (32%)
3 77(100%)	2 (3%)	10 (13%)	**65 (84%)**

Discussion

Criterion-related validity

The criterion-related approach to validity assessment is the emphasis on establishing the relationship between an instrument and some other criteria. An instrument is said to be valid if its scores correlate highly with the other criteria (Polit & Hungler, 1991). In this study, the criterion-related validity was predicted by investigating the relationship between NCD sumscores and RSEP, BOSIP, SSF subscales scores. As expected, correlations between the NCD sumscore and the RSEP subscale scores revealed significant relationships for four subscales. Also strong relationships were found between the NCD sumscore and four SSF subscales. The found correlations make it plausible that the NCD scale, the four significant RSEP subscales, and the SSF subscales constitute a comparable concept.

No significant relationship was found between the NCD sumscore and the BOSIP subscale scores, with the exception of four subscales (see Table 16).

Further inspection of the four subscale items showed similarity in content with corresponding NCD items. This may explain the significant relationship.

A remarkable outcome is the low correlation (.11) on the BOSIP subscale for dependent behaviour.

The following explanation can be given. According to Verstraten and Van Eekelen (1987), this behaviour must be classified in the emotional and affective behaviour types which are caused by a psychological sense of dependency.

So the starting-point of this psychological concept is different from that of the nursing framework on which the NCD scale was developed.
No significance was found for the RSEP subscales aggressivity and depressive behavior. These were subscales with five and three items, respectively, for measuring specific behavioral expressions not taken up in the NCD scale. In summary, the findings based on the results of both hypotheses indicate adequate support for the criterion-related validity of the NCD scale.

Differentiating power

An investigation was conducted into the question whether the NCD scale, comparable with the RSEP and the BOSIP, was able to distinguish specific patient groups and predict the membership of these groups for demented in-patients. Kruskal-Wallis revealed as to each of the NCD items significant differences between the three groups (α=.05). Also the correlation coefficients of Kendall, used to indicate the magnitude of the relationship between each of the NCD items, revealed moderate values (range: -.46 to -.65). In the light of the group results presented in table 18, care dependency seems to increase as the demential illness proceeds. It may be concluded, that the NCD scale appears to be a feasible instrument for distinguishing specific patient groups.
The NCD sumscore led to a correct prediction of 72.4% of the membership in the three groups investigated. However, the percentage of the predicted group membership of the group of 'aged people requiring nursing care' (60%) was significantly lower than the percentages of the two adjacent groups, which were 87% and 84%, respectively. Besides, 32% of the actual group membership of the 'aged people requiring nursing care' was classified within the group of 'aged people requiring intensive nursing care'.
This difference in classifying might be explained by the number of patients in both actual groups (163 and 77, respectively). An other possible explanation is the difference in classifying patients between the NCD sumscore and the RSEP helplessness score.
This part of the differentiating power of the NCD scale deserves further investigation in the future.

Conclusion

This study provides further evidence of the criterion-related validity of the Nursing-Care Dependency scale. Indications for criterion-related validity were found by comparing the NCD scale with three other instruments. Investigation into the differentiating power makes it clear that the NCD scale offers an adequate possibility for classifying demented patient groups in nursing homes, according to the so-called 'Nieuw Toutenburg classification'.
The NCD scale can also be used for other purposes. It provides a simple method by which frequent care needs of demented and mentally handicapped in-patients can be systematically assessed and interrelated. It allows nurses to provide reliable information about the patients' degree of care dependency. This knowledge provides useful information for the planning and performing of nursing care, and offers an opportunity to evaluate changes in the patient's care dependency. For these purposes, further studies into the use of the NCD scale in the nursing process are certainly indicated.

7 An International Psychometric Testing of the Care Dependency Scale

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Abstract

In an international study psychometric properties of the Care Dependency Scale (CDS) were examined by analysing data gathered in Dutch, Canadian, Italian, and Norwegian nursing homes. For that purpose, from these countries a convenience sample was developed consisting of 525 demented patients. The English, Italian and Norwegian research instruments were translations of the original Dutch CDS. Psychometric evaluations of the NCD scale were carried out for each country separately as well as for the four countries combined. High alpha coefficients between .94 and .97 were calculated. Subsequent test-retest and interrater reliability revealed moderate to substantial Kappa values. Factor analysis resulted in a one-factor solution. The scalability of the CDS was demonstrated by means of Mokken scale analysis. One of the main outcomes of the cross-cultural comparison was that the findings in the four countries show more similarities than differences, so that the scale can be used appropriately in nursing home practice.

Introduction

The present study is part of a research project which started in the Netherlands near the end of 1994. The research project concerns the development and psychometric testing of an assessment instrument for use in psychogeriatric nursing homes to assess patients' care dependency. In 1996 an international widening of the Dutch research project took place.

Researchers from Canada, Italy, and Norway participated in the further development of the first product of the research project: a Dutch instrument for assessing care dependency. The purpose of this paper is to give an account of the cross-cultural study to further psychometric testing of the Care Dependency Scale (CDS).
Data sets from the Netherlands, Canada, Italy, and Norway were used to answer the question about international comparability.
The international importance of this study lies in: 1) whether it is justified to compare the nursing-care dependency status of patients with dementia from different cultures on the same instrument; and 2) whether this instrument contributes to the development of international standards for psychogeriatric nursing assessment.
The CDS used in this study provides a framework for the care dependency status of institutionalized patients with dementia. The CDS measures 15 human needs: eating and drinking, incontinence, body posture, mobility, day/night pattern, getting dressed and undressed, body temperature, hygiene, avoidance of danger, communication, contact with others, sense of rules and values, daily activities, recreational activities and learning ability. The instrument consists of these 15 care dependency items, each one of which has an item description, and 5 care dependency criteria. Nurses rated all items by selecting one criterion out of the five written criteria. Low scores on the scale items indicate that patients are completely dependent on care. On the other hand, high scores on the scale items mean that patients are almost independent of care.
Prior to the study presented here, the original Dutch CDS was developed and psychometrically tested. In the first study, the concept of care dependency was operationalized (Dijkstra *et al.*, in press[a]). Content validity was established by 44 experts in a Delphi survey (Dijkstra *et al.*, 1996b). Reliability was documented (interrater reliability (K) .40 to .64; test-retest reliability (K) .55 to .80; Cronbach's Alpha .97) (Diepenmaat *et al.*, 1994). Factor analysis was carried out and resulted in a one-factor solution (Eigenvalue 10.721). In addition, Mokken scale analysis for the whole scale demonstrated a high H-coefficient .75 (Dijkstra *et al.*, in press[b]). In a subsequent study criterion-related validity was examined (Dijkstra *et al.*, in press[c]).

The purpose of this international comparative study was to collect data from patients with dementia in four countries - the Netherlands, Canada, Italy, and Norway - to assess: 1) the similarity in psychometric properties of the NCD scale; and 2) determine whether the CDS scores were comparable across the four countries. The study presented, here, was accepted by the management and the participating nurses of the nursing homes that participated.

Method

Translation procedures

The translation of the original Dutch CDS version into the English, Italian, and Norwegian versions sought equal familiarity and colloquialness in both source and target languages and included items common to both cultures (Chapman & Carter, 1979). The most common and highly recommended procedure for verifying the translation of an instrument is back translation (Jones, 1987). The initial forward translation and back translation were done by the Language Centre of the University of Groningen for the English version. The clarity of each item of the first English version was discussed by the authors together with a visiting professor from the United States. Some item descriptions and item criteria were modified to reach a greater degree of familiarity in both languages. In Italy, two project assistants translated the English CDS version straightforward into an Italian version. The definitive Italian version was determined after comparison both versions. For use in Norway, the CDS was forward translated directly from the English version, by the local project leader, without back translation.

Sample

CDS data collection was carried out in 3 Dutch, 7 Canadian, 3 Italian, and 22 Norwegian nursing homes, respectively. CDS data were obtained from 153 nursing home patients in the Netherlands, 173 nursing home patients in Canada, 80 demented patients in Italy, and 265 patients admitted to Norwegian nursing homes.

Because of the fact that in the Netherlands, CDS data were gathered from patients with DSM-IV Classification 'Delirium, Dementia, and Amnestic and Other Cognitive Disorders', it was decided to use the same selection criteria for inclusion in the Canadian, Italian, and Norwegian subsamples. The final convenience sample of the four countries consisted of 525 patients. As far as available, sample characteristics are given in Table 19.

Table 19 Sample characteristics (as far as data available)

	The Netherlands (*n*=153)	Canada (*n*=116)	Italy (*n*=80)	Norway (*n*=176)
Males	- *)	43	31	44
Females	- *)	73	49	132
Mean age	- *)	81.4	81.4	84.5
Standard deviation	- *)	8.9	8.6	6.8
Age range	- *)	46-96	43-98	60-105
Numbers of settings	3	7	3	22

*) Data not available

Procedure

The CDS being intended to assess care dependency, rating in the four countries was done by the nurse or nurse's aide most involved in the daily care of the patients. To ensure the patients' privacy, the names of the participants were encoded.

In order to evaluate whether the CDS could be used for international comparison of institutionalized patients with dementia, CDS data obtained from each country separately as well as from the four data sets combined, were analyzed. First, the internal consistency of the CDS was assessed with item analysis (mean and standard deviation) and Cronbach's alpha. In addition, the absence of chance errors was investigated in order to determine the reliability of the instrument. In that sense, reliability is regarded as an aspect of validity. Repeated measurements involving the same raters and patients in identical circumstances were performed to determine the reliability of the measurement, i.e. the absence of systematic errors.

The measurements were repeated in two different ways. First, the interrater reliability was determined. Two raters independently administered the CDS for the same patient and at the same time. Second, the test-retest method was used.

One of the raters filled in the CDS for the same patient at two points in time with a two week time interval. This method was based on two assumptions: (1) no learning effects have occurred in the observer, (2) the health of the patient does not change dramatically in the period between the first and second measurement.
Furthermore, with regard to validity the CDS was assessed to determine whether it actually measures care dependency and does not contain any systematic errors. The factor analysis procedure was used to identify cultural similarities between the countries regarding the underlying concept of the CDS: care dependency. Mokken scale analysis was used in a second approach to construct validation of the CDS for each country. Mokken scale analysis defines the scalability of the items and, consequently of the instrument. The Mokken scale technique assumes that all necessary information for the analysis is present in the sum of the items.

Results

Reliability aspects

Table 20 depicts basic statistics for each country separately as well as for the four data sets combined. According to Oneway analysis of variance, item analysis revealed that the mean values on 8 of the 15 CDS items were significantly different across the four countries. Taking the CDS as a whole, no significant equality was found among the CDS total score in the four countries.
In order to obtain more insight into the differences between the individual countries, Independent T-tests were carried out. Between the individual countries, no significant differences were found on 'eating and drinking', 'mobility', 'getting (un)dressed' and 'contact with others'.
Further, between Canada, the Netherlands and Norway, no significant differences were found on 'incontinence', 'body posture and 'body temperature', however, these countries differed significantly on 'daily activities' and 'recreational activities'. On 'day/night pattern' Dutch and Canadian patients as well as Italian and Norwegian patients did not differ significantly.

On 'hygiene' the same can be said for comparisons between on the one hand Canadian and Italian patients, and on the other Norwegian patients.

Table 20 Means, standard deviation, and internal consistency of the CDS

CDS-items	The Netherlands (n=153) $\bar{x}$ (SD)	Canada (n=116) $\bar{x}$ (SD)	Italy (n=80) $\bar{x}$ (SD)	Norway (n=176) $\bar{x}$ (SD)	Total sample (n=525) $\bar{x}$ (SD)	One-way Anova p<.05
Eating and Drinking	2.6(1.4)	2.3(1.2)	2.5(1.4)	2.3(1.1)	2.4(1.2)	ns
Incontinence	2.5(1.5)	2.6(1.5)	2.0(1.4)	2.6(1.5)	2.4(1.5)	.027
Body Posture	3.0(1.5)	2.9(1.5)	2.4(1.4)	2.9(1.4)	2.9(1.4)	.036
Mobility	3.0(1.7)	2.8(1.6)	2.6(1.5)	2.7(1.7)	2.8(1.6)	ns
Day/Night Pattern	3.3(1.3)	3.0(1.4)	2.3(1.2)	2.6(1.2)	2.8(1.3)	.000
Getting (Un)dressed	2.1(1.4)	1.9(1.3)	1.8(1.2)	2.1(1.4)	2.0(1.3)	ns
Body Temperature	2.5(1.3)	2.5(1.2)	2.1(1.1)	2.6(1.1)	2.5(1.2)	ns
Hygiene	2.2(1.2)	1.7(1.1)	1.4(0.8)	1.6(1.0)	1.8(1.1)	.000
Avoidance of Danger	2.3(1.5)	2.0(1.2)	1.6(1.0)	1.9(1.1)	2.0(1.2)	.000
Communication	3.4(1.3)	2.9(1.5)	2.6(1.3)	3.5(1.4)	3.2(1.4)	.000
Contact with Others	2.4(1.3)	2.2(1.2)	2.1(1.1)	2.2(1.1)	2.2(1.2)	ns
Sense of Rules / Values	2.1(1.4)	1.7(1.1)	1.9(1.3)	1.8(1.2)	1.9(1.3)	ns
Daily Activities	1.9(1.1)	1.7(0.9)	1.5(0.9)	1.4(0.8)	1.6(0.9)	.000
Recreational Activities	2.0(1.1)	1.5(0.9)	1.5(0.9)	1.2(0.6)	1.6(1.0)	.000
Learning Ability	1.9(1.0)	1.7(0.9)	1.6(0.9)	1.6(0.9)	1.7(0.9)	ns
Total scale (15 items)	37.0(16.5)	33.5(13.8)	30.0(13.1)	32.9(13.6)	33.8(14.6)	.003
Cronbach's alpha	.97	.94	.94	.95	.95	

On 'learning ability' only those item-means derived from Dutch patients and compared with those from the Italian patients revealed significant differences. Furthermore, the item-mean on 'sense of rules/values' differed significantly only between on the one hand Dutch patients and on the other hand Canadian and Norwegian patients.

Taking the CDS as a whole, a significant difference was found only between patients from the Netherlands and Norway, and the Netherlands and Italy.

Cronbach's alpha was calculated at the scale level for each of the four data sets as well as for the whole sample. The results, ranging from .94 to .97 across the four countries, were in accordance with those previously reported (Dijkstra *et al*., submitted).

Cohen's Kappa was used to calculate the interrater reliability regarding the values of the first and second measurements, and the test-retest reliability concerning the data of the first and third measurements (Cohen, 1960). The verbal descriptions for different ranges of Kappa statistics, as described by Landis & Koch (1977) are: slight (<.20), fair (.21-.40), moderate (.41-.60), substantial (.61-.80), and almost perfect (>.80).

For the Canadian data set, the interrater reliability had a lower N-value (n=55). This lower N-value can be explained by the fact that Kappa was only determined for the data available from patients of 2 nursing homes. As can been seen from Table 21, the four data sets combined revealed moderate Kappas between .43 and .63. For the Canadian subsample, a broader range in Kappas between .27 and .80 was found, indicating a fair to substantial interrater reliability.

Table 21 Interrater reliability in the four countries (K) of the CDS

CDS-items	The Netherlands (*n*=153)	Canada (*n*=55)	Italy (*n*=80)	Norway (*n*=176)	Total sample (*n*=464)
Eating and Drinking	.59	.58	.75	.50	.59
Incontinence	.56	.51	.82	.64	.63
Body Posture	.48	.40	.75	.46	.51
Mobility	.58	.63	.83	.56	.62
Day/Night Pattern	.39	.27	.76	.35	.43
Getting (Un)dressed	.52	.80	.71	.54	.59
Body Temperature	.54	.49	.74	.39	.52
Hygiene	.59	.44	.70	.49	.57
Avoidance of Danger	.51	.37	.73	.43	.50
Communication	.42	.42	.74	.45	.49
Contact with Others	.47	.45	.63	.38	.46
Sense of Rules /Values	.48	.34	.64	.42	.47
Daily Activities	.50	.35	.64	.46	.50
Recreational Activities	.42	.33	.78	.33	.50
Learning Ability	.39	.71	.59	.53	.52

For the Italian subsample, predominantly high Kappas between .59 and .83 were found.

As Table 22 depicts, concerning the four data sets combined test-retest reliability revealed moderate to substantial Kappa statistics ranging from .55 and .69 over an interval of two weeks. When the four countries are considered separately, no Kappa statistics are higher than substantial and none fall below moderate. Thus, these results are consistent with the statistics of the combined findings.

Construct validity

Factor analysis (principal components analysis) was carried out to find the common dimensions in the 15 care dependency items. In Table 23 factor loadings of the scale items, eigenvalues and percentages of explained variance are presented. For the total sample the first factor had eigenvalue of 9.28 and this factor explained 61.9% of the variance.

Table 22 Test-retest reliability in the four countries (K) of the CDS

CDS-items	The Netherlands (*n*=153)	Canada (*n*=116)	Italy (*n*=80)	Norway (*n*=176)	Total sample (*n*=525)
Eating and Drinking	.66	.65	.70	.66	.67
Incontinence	.65	.74	.67	.69	.69
Body Posture	.61	.66	.74	.62	.65
Mobility	.62	.69	.78	.70	.69
Day/Night Pattern	.56	.50	.66	.50	.55
Getting (Un)dressed	.72	.69	.49	.65	.66
Body Temperature	.60	.60	.72	.55	.61
Hygiene	.61	.70	.76	.64	.66
Avoidance of Danger	.61	.60	.65	.56	.60
Communication	.55	.60	.63	.47	.55
Contact with Others	.55	.57	.67	.53	.57
Sense of Rules /Values	.70	.60	.69	.61	.65
Daily Activities	.61	.59	.75	.65	.65
Recreational Activities	.47	.68	.71	.42	.58
Learning Ability	.58	.64	.61	.66	.63

Factor extraction for the 4 combined countries demonstrated that all 15 items fell in the first factor.

Factor loadings ranged from .66 to .86. As none of the items had a factor loading lower than .40, no item reduction took place. In the four individual countries, corresponding findings on the first factor can be observed.

Compared to Canada, Italy, and Norway the Dutch findings were higher on average. Results of the second factor are also reported in Table 23. Although the items 'Body posture' and 'Mobility' loaded highly, in the combined sample as well as in the separate subsamples, these items were retained with the first factor as it was a better fit with the concept of care dependency.

In a further assessment of construct validity, a Mokken scale analysis was carried out (Mokken, 1971; Meijer, Sijtsma, & Smid, 1990; Sijtsma, Debets, & Molenaar, 1990; Molenaar, Debets, Sijtsma, & Hemker, 1994). The scalability of the items in a Mokken scale is given by Loevinger's coefficient (H) which is usually set at equal to or greater than .40. All items of the CDS instrument fitted very well in the scale.

Table 23 Factor loadings, Eigenvalue, and % variance of the CDS

CDS-items	Netherlands (*n*=153) Factor		Canada (*n*=116) Factor		Italy (*n*=80) Factor		Norway (*n*=176) Factor		Total sample (*n*=525) Factor	
	1	2	1	2	1	2	1	2	1	2
Eating and Drinking	.85	.03	.68	.18	.81	.15	.64	-.01	.74	.09
Incontinence	.81	.16	.76	.36	.78	.28	.80	-.31	.78	.32
Body Posture	.81	.49	.73	.48	.74	.53	.80	-.41	.78	.49
Mobility	.69	.64	.58	.69	.63	.66	.69	-.52	.66	.63
Day/Night Pattern	.71	.15	.61	-.20	.70	.06	.76	.03	.71	-.01
Getting (Un)dressed	.88	.16	.83	.17	.78	.31	.85	-.18	.84	.20
Body Temperature	.92	-.09	.85	.02	.78	-.22	.87	-.02	.86	-.04
Hygiene	.92	.09	.83	.08	.75	-.09	.80	.17	.85	.01
Avoidance of Danger	.89	-.14	.81	-.05	.84	-.11	.85	.06	.86	-.11
Communication	.79	-.14	.78	-.28	.74	-.32	.68	-.12	.73	-.16
Contact with Others	.89	-.15	.82	-.38	.66	-.44	.81	.04	.82	-.27
Sense of Rules /Values	.85	-.28	.76	-.32	.81	-.36	.79	.16	.80	-.29
Daily Activities	.87	-.14	.78	-.07	.83	-.06	.78	.44	.82	-.19
Recreational Activities	.86	-.19	.69	-.27	.77	-.08	.65	.51	.74	-.27
Learning Ability	.74	-.36	.79	-.26	.69	-.26	.83	.23	.77	-.28
Eigenvalue	10.42	1.10	8.62	1.42	8.57	1.48	9.06	1.15	9.28	1.16
% variance	69.5	7.3	57.5	9.5	57.1	9.9	60.4	7.7	61.9	7.7

From the individual item values H_i, a Loevinger's coefficient (H) for the whole scale was produced. The outcomes were .73, .60, .59, .67, and .65 for the Netherlands, Canada, Italy, Norway, and the four countries combined, respectively. According to Mokken (1971), this result suggests a strong scale. The results of the above analyses are depicted in Table 24.

Discussion

Like most cross-cultural research, this study was designed to identify similarities in reliability and validity for the Dutch, English, Italian and Norwegian versions of the CDS and to assess whether the CDS scores were comparable across these countries.
For that purpose, first the reliability was determined.

Table 24 Mokken-scale analysis (H_i and H) of CDS for the separate and combined samples

CDS-items (H_i)	The Netherlands (n=153)	Canada (n=116)	Italy (n=80)	Norway (n=176)	Total sample (n=525)
Eating and Drinking	.74	.56	.64	.55	.62
Incontinence	.70	.62	.61	.69	.65
Body Posture	.72	.61	.59	.69	.66
Mobility	.61	.47	.51	.60	.56
Day/Night Pattern	.64	.48	.54	.64	.58
Getting (Un)dressed	.77	.67	.61	.72	.69
Body Temperature	.80	.68	.59	.73	.71
Hygiene	.81	.68	.64	.69	.70
Avoidance of Danger	.77	.63	.66	.71	.70
Communication	.71	.62	.59	.64	.63
Contact with Others	.76	.63	.50	.68	.66
Sense of Rules /Values	.73	.61	.61	.66	.65
Daily Activities	.76	.64	.65	.70	.68
Recreational Activities	.73	.56	.60	.68	.62
Learning Ability	.66	.63	.53	.70	.64
Scale coefficient (H)	.73	.60	.59	.67	.65

Regarding internal consistency, item analysis provided support for the adequacy of measuring nursing-care dependency. Although only patients with dementia were included in the separate samples, differences in statistical significance at the item level can be caused by the patients' state of care dependency; but, raters can also differ in their ability and experience in assessing care dependency. The Dutch scores on the CDS items had higher means and standard deviations than the corresponding Canadian, Italian and Norwegian scores. Thus, Canadian, Italian and Norwegian patients may be described as somewhat more care dependent and with somewhat more homogeneous scores than Dutch patients.

Cronbach's alpha obtained from the combined as well as separate data sets ranged from .94 to .97 indicating an excellent level of reliability.

According to Polit & Hungler (1991), the reliability of the scale is good enough for assessment purposes, both on a group and on an individual level, in each country.

Regarding interrater Kappas, the item 'day/night pattern' in the combined as well as the separate data sets form the Netherlands, Canada and Norway, proceed only a fair amount of agreement. A possible explanation could be that nurses have interpreted the core concept 'day-night pattern' in different ways. Comparing the total results with each country separately, in the Canadian as well as in the Norwegian interrater subsamples only fair agreements were found on another 4 items. Inspection of these items showed that differences in nuance in choosing one or two successive criteria were mainly responsible for lower Kappa statistics on these items. The fact that two of these items concerned the structuring of daily activities and participation in activities outdoors, likely identifies cultural differences in policy regarding patient activities among these countries. Further assessment is recommended to bring the content of these items into conformity with the national nursing practice in nursing homes. A methodological artifact which probably influences the Canadian and Italian interrater results is the size of the subsample (n=55 and n=80, respectively), as in each country interrater data were gathered in three nursing homes. Furthermore, in Canada, there was a great number of raters in two of these nursing homes: 8 and 11 raters, respectively. Most of these raters filled in only one CDS, which probably did not give them enough experience in using the instrument.

Stability of scores was assessed, using a test-retest strategy. Kappa statistics on scores across the two-week interval revealed moderate to substantial Kappa values for the separate countries as well as the total sample.

Proceeding, the analysis on construct validation, factor analysis resulted in a one-factor solution both for each country and for the four data sets combined. The analysis did reveal a second factor consisting of two items: 'body posture' and 'mobility'.

However, according to the principle of discontinuity (Polit & Hungler, 1991), the sharp drop in the percentage of explained variance between the first and second factors in the (sub)samples, indicates that an appropriate termination point has been specified making it advisable to extract only the first factor.

The high factor loadings for the four countries prove that all items were affected by the same underlying care dependency concept.

In comparing Dutch, Canadian, Italian and Norwegian findings, higher eigenvalues and percentage of variance were found in the Dutch samples.

Mokken scale analysis revealed substantial H-coefficients for the separate data sets and these subsamples combined. This means there was a strong hierarchical scale (Mokken, 1971). Therefore, the separate CDS item scores may be added. Besides, it is statistically acceptable that patients with an identical sumscore and on the same items, are equally dependent on care.

Taking the results together, analysis demonstrate that the CDS proved to be reliable in terms of internal consistency, equivalence and stability. In addition, psychometric properties regarding construct validity were acceptable and showed strong similarities across the countries. The aforementioned criteria showed that the CDS may be useful in the four countries on both group and individual levels. Furthermore, the CDS sumscore can be used safely as an overall indicator of care dependency. Besides, the CDS items have proven to be related to, what Henderson (1966) calls, *fundamental* human needs which appear in every patient-nurse relationship, independent from cultural background. Although further research is needed, there is evidence that the CDS can be used for international comparisons and can contribute to the development of international standards for need assessment of patients with dementia.

8 Care Dependency and Survival Among Female Patients with Alzheimer's Disease: A Two-Year Follow-Up

Ate Dijkstra, Dick Sipsma, Theo Dassen

Abstract

The aim of this study is to investigate the relationship between the severity of patient's care dependency on the one hand, and causes of death, co-morbidity, and survival on the other, and to find out which of these factors might be longitudinal predictors of survival. A two-year follow-up study started in 1994 in the Netherlands. Subjects were 130 female nursing-home patients with Alzheimer's disease (91 severely dependent women, and 39 mildly dependent). Features analysed in 1994 included the scale of care dependency, demographic data and clinical information. In 1994, both subsamples differed significantly with respect to the duration of Alzheimer's disease, duration of stay, and all nursing-care dependency features, but they did not differ significantly in age, age of disease onset, and co-morbidity. In both groups, the main causes of death were cachexia and/or dehydration. Survival prognosis varied with the level of care dependency. Compared to mildly dependent patients, patients with severe dependency had a 20% higher mortality than expected for the general population of the same age. Marital status, education, cardiovascular disease, and four care dependency features: body posture, day/night pattern, communication, and contact with others, are factors that significantly predict survival. In conclusion, survival prognosis of patients with Alzheimer's disease varied with the level of care dependency. Recommendations for future studies were made.

Introduction

Nursing care in psychogeriatric nursing homes aim at patients with mental deteriorations, most of them with dementia (Schrijvers *et al.*, 1997). In the Netherlands, there are 70 nursing homes, with a total capacity of 25,600 inpatient beds in which psychogeriatric patients are admitted. These nursing homes provide long-term treatment which includes activities such as care, treatment, and therapy (National Hospitals Council, 1989; Schrijvers *et al.*, 1997).

In this study, a psychogeriatric nursing-home population was followed during a two-year period in order to investigate the relationship between survival and patient's functioning. There are many reports describing the survival in relation to demographic factors and various kinds of functioning, such as social, economic, cognitive, physical and clinical functioning (Van den Heuvel, 1977; Palmore *et al.*, 1985). On the basis of these factors in literature, Boersma *et al.* (1996) report that a shorter survival in dementia is associated with multi-infarct-dementia, dependency in daily living activities, somatic co-morbidity, incontinence, alcohol abuse, severity of dementia ('how far'), progression of cognitive deterioration ('how fast'), institutionalization, behavioral problems, and language disorders or aphasia.

Although most of these studies generate knowledge for the medical and psychological disciplines, prognosis of survival among patients with dementia is also an important issue for nurses. During a patient's stay at a nursing home, nurses are confronted with increasing care dependency and, ultimately, the patient's death. Studies addressing survival from a nursing perspective are sparse. According to Miller (1985a, 1985b), literature on patient dependency shows that increasing dependency on nursing care is associated with higher mortality. Van Dijk *et al.* (1991) report that dependency factors in general have some prognostic value. However, it is questionable whether there is a relationship between patient dependency on nursing care and prognosis of survival, since care dependency does not represent the cause but the effect of health problems, and most causes of death are reflections of the course of somatic illness preceding death (Boersma *et al.*, 1996). Therefore, we formulated the research questions regarding the differences in demographic and care dependency characteristics between patients with severe and mild dependency, their co-morbidity and causes of death.

We also took a special interest in survival prognosis related to the severity of the patient's care dependency and in the question which care dependency, demographic and/or clinical factors might be a longitudinal predictor of survival in Alzheimer's disease.

Methods

This research project has been designed as a panel study, which is a specific type of longitudinal studies. In the panel studies, the same subjects are used for obtaining data at two or more points in time (Polit & Hungler, 1991).

Subjects

A panel for this study was sampled from a psychogeriatric nursing home in the northern part of the Netherlands that consented to participate in the research project. Since 1994, 130 female patients with a clinical diagnosis of Alzheimer's disease (AD) from the nursing home population (n=219) were included in the study. The diagnosis of AD was made on the basis of the Diagnostic and Statistical Manual of Mental Disorders (4th ed.) criteria for dementia (American Psychiatric Association, 1994). Patients with dementia due to other causes (n=73) and patients (n=5) who returned to their own home or were admitted in another long-term care facility during the research period were excluded from the study. Eleven male patients with AD were also excluded from the sample.

Instrumentation

Data were collected using two sources. The first was the Care Dependency Scale (CDS), which provides a framework for the care dependency status of institutionalized demented patients. The CDS measures 15 human needs: eating and drinking, incontinence, body posture, mobility, day/night pattern, getting dressed and undressed, body temperature, hygiene, avoidance of danger, communication, contact with others, sense of rules and values, daily activities, recreational activities, and learning ability. The possible score in each item ranges from 1 to 5; the higher the score, the less dependent patient is on care.

The last question on the scale asks for a specific rating of the degree of care dependency on a 5-point Likert-scale ranging from 1 for completely dependent to 5 for almost independent of care. The CDS has been psychometrically tested in four studies. Content validity was established by 44 experts in a Delphi survey (Dijkstra *et al.*, 1996b). Interrater reliability (kappa) was .40 to .64; test-retest reliability (kappa) was .55 to .80; and Cronbach's Alpha was .97) (Diepenmaat *et al.*, 1994). Construct validity was determined by a factor analysis and resulted in a one-factor solution (Eigenvalue 10.72). In addition, Mokken-scale analysis resulted for the whole scale in a high H-coefficient 0.75 (Dijkstra *et al.*, in press[b]). In the fourth study, criterion-related validity was examined. Findings indicate adequate support for the criterion-related validity of the CDS (Dijkstra *et al.*, in press[c]). The second source used in this study was the SIG Verpleeghuis Informatie Systeem (SIVIS), a national registration system of clinical, nursing and demographic data of Dutch nursing-home patients (SIG, 1994).

Procedure

In order to investigate the survival prognosis, at the study entry the panel was divided into a group of patients with mild dependency and a group of patients with severe dependency. The difference in the severity of patients' care dependency was based on the median score of the CDS, which ranges from 0 to 75. The median score for the whole panel was 37.5. Patients with score 37.5 or less were regarded as having severe care dependency, and the group with the score higher than 37.5 consisted of patients with mild care dependency. Data collection (T1) started in April 1994 with 130 patients. They were followed until April 1996 or until death. CDS was assessed for all patients at T1 time point. The ratings were carried out by the nurses or nurse aides who were most involved in the daily care of the particular patient and who knew how to use the instrument. Filling in the CDS instruments took about 15 minutes. To ensure the patients' privacy, the names of the participants were encoded. The measures of dependency on care used in this study were the 15 features and the sumscores of these 15 items.

Demographic data on age, marital status, education, and time of admission was obtained from the patient's demographic record in the SIG Verpleeghuis Informatie Systeem at T1 time point.

Clinical records of the 62 patients who died within the two-year period were examined for the date of death, age at death, and cause of death. Cause of death of 10 patients was obtained from autopsy records, whereas for the remaining 52 patients, the clinical records made by attending physicians were consulted.
Supplementary clinical information on DSM-IV diagnoses and co-morbidity was found in retrospect in the patient's medical care plan at T1 time point. Date of onset of the Alzheimer's disease was obtained from the closest informant available at the time of admission. This information was registered in the patient's medical care plan.
As the study aimed to investigate survival, the following study variables were chosen. The expected number of survivors was based on the mortality quotient derived from the 1995 Dutch life tables for the general population (CBS, 1997). The longevity quotient (LQ) was used as a dependent variable to predict survival. LQ was calculated according to Palmore (1974) as the observed number of years of survival after study entry, divided by the expected number of survival years after study entry. For those patients who were still alive at study endpoint, an estimate was made of how many years they will have lived since the study entry by adding the present number of years survived since the study entry to the expected number of years now remaining according to 1995 Dutch life tables for the general population of the same sex and age (CBS, 1997).

Statistics

Data were analyzed using the Statistical Product and Service Solution Windows version 7.5. (SPSS, 1997). The frequencies procedure was used to provide statistics on mean and standard deviation. T-test for independent samples was used to compare the means of item variables for both non-survivors and survivors at the study entry. In order to examine variables explaining survival, a multiple regression analysis was performed. In all analyses, only *p*-values of less than .05 were considered significant.

Table 25 Characteristics of female patients with Alzheimer's disease (AD) at study entry, by severity of care dependency and significance

Variables	Severity of Care Dependency Severe (n=91) $\bar{x} \pm SD$	Mild (n=39) $\bar{x} \pm SD$	t-test p<0.05
Age (yrs)	84.5±6.8	83.0±6.6	ns
Age at Onset AD (yrs)	75.2±7.1	77.5±7.7	ns
Duration of AD (yrs)	9.6±4.1	6.0±3.7	.000
Duration of Admission (yrs)	4.6±4.4	1.8±2.3	.000
Care Dependency features			
Eating and drinking	1.9±0.8	3.6±0.9	.000
Incontinence	1.6±1.0	4.0±1.1	.000
Body posture	2.2±1.1	4.5±0.9	.000
Communication	2.3±1.0	4.2±1.2	.000
Day/night pattern	2.2±1.0	3.5±1.0	.000
Getting (un)dressed	1.3±0.5	3.4±1.0	.000
Body temperature	1.6±0.5	3.7±1.0	.000
Hygiene	1.4±0.5	3.4±0.9	.000
Avoidance of danger	1.2±0.5	3.4±1.1	.000
Daily activities	2.4±1.2	4.3±0.7	.000
Contact with others	1.6±0.6	3.5±1.1	.000
Sense of rules and values	1.2±0.6	3.6±0.9	.000
Mobility	1.2±0.4	3.3±1.0	.000
Recreational activities	1.3±0.6	2.9±0.9	.000
Learning ability	1.3±0.5	2.5±1.0	.000
Marital Status (N)			ns
Partner	8	1	
No partner	83	38	
Education (N)			ns
Primary education	71	27	
Secondary education	10	8	
Higher education	10	4	
Somatic co-morbidity (N)			
Cerebrovascular disease	24	7	ns
Cardiovascular disease	24	10	ns
Pulmonary disorder	10	3	ns
Musculoskeletal problem	24	10	ns
Endocrine disorder	16	7	ns
Malignancy	5	1	ns
Urinary disorder	11	3	ns
Gastrointestinal disorder	16	4	ns
Cachexia/dehydration	8	1	ns

Results

At study entry, no significant differences were revealed between severely and mildly dependent patients in their age, marital status, education, and age at onset of Alzheimer's disease (Table 25). Severely dependent patients had a longer duration of the disease ($p<.001$) and a longer duration of stay at the nursing home ($p=.001$) than mildly dependent patients.

At study entry, 88% of the patients had one or more somatic co-morbidities, and 12% had multi-pathology with more than 3 somatic chronical illnesses. Table 25 shows co-morbidity in both subsamples related to the nine most frequently occurring diagnostic categories. Co-morbidity mainly related to cardio-vascular diseases, musculoskeletal problems, and cerebro-vascular diseases. Severly and mildly dependent patients did not differ in any of the categories of the somatic co-morbidity. Finally, the CDS item scores for both groups were compared (Table 25). Independent-samples *t*-tests confirmed that both subsamples were different in each of the CDS features ($p=.001$).

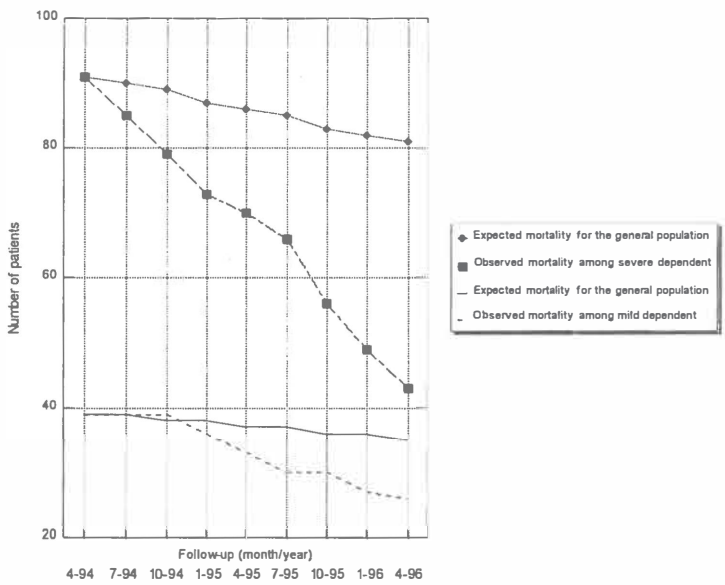
The leading primary underlying causes of death according to the dependency status among non-survivors were shown in Table 26. Cachexia and dehydration predominated as causes of death (32%), followed by pulmonary disorder (26%) and cardio-vascular disease (21%). It appears that pulmonary disorder, as well as cachexia/dehydration, increase as causes of death with the increase in the degree of care dependency.

On the basis of the 1995 mortality quotient for the general population (CBS, 1997), the expected number of dead persons was 10 in patients with severe dependency and 4 in the patient group with mild dependency. After 2 years, the observed number of survivors in the group with severe dependency was 43 (89% expected, 47% observed), and 26 in the group with mild dependency (90% expected, 67% observed). Although the expected survival percentage in the two dependency groups was almost equal, a significantly higher percentage of observed patients who survived was found among patients with mild dependency (see above, in parentheses, mentioned percentages).

Table 26 Underlying cause of death in Alzheimer's disease

Variables	Severely dependent		Mildly dependent	
	n	%	*n*	%
Cerebrovascular	3	6	-	-
disease	8	17	5	36
Cardiovascular disease	14	29	2	14
Pulmonary disorder	1	2	-	-
Malignancy	7	15	2	14
Urinary disorder	15	31	5	36
Cachexia/dehydration	48	100	14	100
All				

Figure 8 Course of mortality by care dependency status



There was a difference in the course of mortality between patients of the two care dependency groups (Figure 8).
Compared to the mild dependency group, a more progressive course of mortality was found in patients with severe dependency. In the first two quarters after study entry, mildly dependent patients had even the same survival prognosis as females of the same age in the general population. More than 50% of patients with severe care dependency died within 2 years.
In the first two quarters after the study entry, mildly dependent patients had even the same survival prognosis as females of the same age in the general population. In this group, about 25% of the patients died within 2 years.
To study whether care dependency, demographic and/or clinical factors are predictors of survival, LQ was used as the dependent variable in a regression analysis, with the following independent variables at study entry: age, marital status, education, age at onset, duration of Alzheimer's disease, duration of the stay at the nursing home, co-morbidity, the 15 CDS items, and the degree of care dependency. The possible interaction effects between both dependent and independent variables were entered in a stepwise procedure, with a criterion for entry set at the .05 level of significance. Only those variables were revealed that added a statistically significant increase to the variance explained.
A separate regression analysis was performed for the total panel and for both dependency groups (Table 27). The first column of the Table 27 presents standardized beta coefficients for each predictor, showing the relative influence of each predictor on longevity quotient when all the others are considered simultaneously (CBS, 1997). The second column presents the adjusted R square, which is designed to compensate for optimistic bias and which can be seen as the proportion of the total variance on the longevity quotient accounted for by each independent variable (Palmore, 1974).
In the total panel, the CDS item 'body posture' was the strongest predictor for survival; it accounted for 7.4% of the total variation. Although their contribution was low, effects of cardiovascular disease, day/night pattern, education, and marital status accounted for 5.4%, 3.7%, 2.0%, and 2.8% of the variance, respectively. In the severely dependent patient group, longevity quotient was predicted independently by cardiovascular disease (3.4%), body posture (4.4%), and contact with others (3.2%).

In the mildly dependent group, the regression procedure showed significant effects of communication and marital status, which accounted for 16.5% and 8.8% of the variance, respectively.

Table 27 Significant predictors of longevity quotient at study entry: stepwise regression analysis

	Beta	Adjusted R^2
Total panel (n=130):		
Body posture	.39	.074
Cardiovascular disease	-.26	.128
Day/night pattern	-.22	.165
Education	.19	.185
Marital status	.19	.213
Severely dependent patient group (n=91):		
Cardiovascular disease	-.24	.034
Body posture	.31	.078
Contact with others	-.22	.110
Mildly dependent patient group (n=39):		
Communication	.47	.165
Marital status	.33	.253

Discussion

Comparing patients with severe dependency and those who were assessed as mildly dependent, descriptive findings showed that the first group had a longer duration of Alzheimer's disease at the study entry, stayed longer at the nursing home, and were more dependent on care. These findings are well in accordance with the practical experience of (nurse) professionals. The mean age at onset among the total panel (75.9 years) was in accordance with other studies (Diesfeldt *et al.*, 1986; Koopmans *et al.*, 1991; Muskens *et al.*, 1993) and the mean duration of AD (8.5 years) was higher in comparison with studies by Diesfeldt *et al.* (1986) and Koopmans *et al.* (1991). The presence of cardiovascular diseases as co-morbid condition was found for 36.1% of those in the total panel who deceased. The similar percentage was reported by Koopmans *et al.* (1991).

Regarding co-morbidity, the limitation of our study was that only the measures taken at study entry were used for analysis, and that new co-morbid factors between study entry and study endpoint were not considered. The leading reported cause of death was cachexia/dehydration, followed by pulmonary disorder, and cardio-vascular disease.

These findings are similar to the ones in studies by Koopmans *et al.* (1991), Olichney *et al.* (1995), and, recently, Boersma *et al.* (1996). It is very interesting that in cases of cachexia and dehydration no other pathology was reported in the death certificate. This suggests that these symptoms are directly caused by the general weakness of the Alzheimer's disease patient in the terminal state.

If renal insufficiency was reported it was the result of dehydration because of the negative fluid balance, i.e., the very low intake of fluid as the result of the patient's mental state. General policy at Dutch nursing homes is to give no parenteral fluid when the Alzheimer's disease patient is in a terminal state. Malignancy was rarely reported as the cause of death, whereas it was the second leading cause of death (accounting for 25% of 1995 deaths of persons of 65 years of age and older) for a comparable age group in the Dutch population. Olichney *et al.* (1995) reported the same phenomenon in their study and pointed to two possible explanations: dementing patients have a markedly increased mortality rate attributable to a variety of causes other than neoplasms; and a potential selection bias.

Regarding survival prognosis in both dependency groups, the observed mortality rate was lower than it was expected. The results demonstrate a clear difference of 20% in excess mortality between severely dependent patients and mildly dependent patients.

The excess mortality seemed to be most prominent in the second year of study. Regarding the non-survivors from the mild dependency group, these patients were probably severely demented and had a more progressive mortality course. This is in accordance with the general idea of the existence of AD-subtypes and variability in the course of dementia (Boersma *et al.*, 1996; Schneider *et al.*, 1997).

Regarding care dependency, all the patients did not successively attend the several stages of care dependency. In accordance with other studies (Van Dijk *et al.*, 1991), another general conclusion from this study can be that patients with AD, compared to the general population, had considerably shorter survival rates.

Regression analysis revealed demographic, social-economic, medical, and nursing factors that could predict the survival of AD patients.
In the total panel, the CDS item 'body posture' was the strongest predictor of longevity. This variable assessed the extent to which the patient was able to adopt a position appropriate to a certain activity. The significance of this phenomenon is comparable with cachexia and dehydration, because it is the expression of pathological and psychophysiological functioning caused by the progression of cortical and subcortical neuronal decay. Patient with a high score on this item is chairfast or even bedridden, which can easily lead to several physical complications like bronchopneumonia, bedsores, and urinary incontinence. Cardio-vascular disease was the second significant predictor of survival. The third variable that entered the regression analysis was 'day/night pattern' suggesting that a normal day/night pattern and enough rest may contribute to longevity. The correlation between 'day/night pattern' and longevity can be explained in the similar way like 'body posture' factor. The finding that education predicted longevity reflects the importance of the level of education of institutionalized patients because poor education puts patients at a greater risk of earlier death.
The demographic variable 'marital status' was the final predictor in the total panel, indicating that being single had a significant negative effect on survival. Longevity in patients with a severe dependency status was predicted independently by cardiovascular disease, body posture, and contact with others. These variables accounted for 11% of the total variance. Thus, being severely dependent on (nursing) care, having a cardiovascular disease, inability to adopt a position appropriately for a certain activity, as well as inability to appropriately make, maintain and end social contacts put Alzheimer's disease patients at a high risk of death.
Longevity in the mildly dependent patient group was predicted first by communication and second by Marital Status. The communication item is strongly related to the nursing diagnosis 'Impaired Verbal Communication' with Alzheimer's disease as a common cause (Cox *et al.*, 1993; Cusack, 1991). Apparently, having language disorders or aphasia put patients at some more risk of earlier death. The final significant predictor of longevity among mildly dependent patients was marital status.
In conclusion, in the assessment of the patient's survival as a predicting factor in care, four care dependency factors were related to survival.

Survival prognosis varied with the level of care dependency, notwithstanding the fact that care dependency is not the cause but the effect of health problems. Within this scope, (nursing) care should primarily focus on helping patients to minimize the effects of associated co-morbidity, to perform those activities that contribute to stabilization or decrease of care dependency, and, as Henderson (1978, 1985) repeatedly emphasized, to help patients to die with dignity when death is inevitable.

From a methodological point of view, a possible limitation in generalizing the findings of this study is that the data were obtained from patients of one particular psychogeriatric nursing home and that the patients in the panel were all women. Therefore, further longitudinal research is needed to find whether the patient group studied is representative of the total population of Alzheimer's disease patients. Apart from that, studies are needed to investigate longitudinal changes and differences in care dependency in order to predict care dependency in Alzheimer's disease. Outcomes of such studies may add to the understanding of the specific dimensions of patient dependency on (nursing) care and of factors that are related to nurses' abilities to decrease or stabilize dependency of their patients.

9 Predictors of Care Dependency in Alzheimer's Disease After A Two-Year Period

Ate Dijkstra, Dick Sipsma, Theo Dassen

Abstract

This paper presents the results from a panel study in the Netherlands among 68 female in-patients with Alzheimer's Disease. The main focus of this study was to investigate longitudinal changes and differences in care dependency. Descriptive statistics indicated an increase in almost all 15 features of dependency in a 2-year period. Regarding differences in care dependency, the social-demographic factor 'years of residence' and the clinical factor 'duration of Alzheimer's disease' in particular correlated significantly with most of the nursing-care dependency ratings. A stepwise procedure revealed that the loss of social relationships, the loss of the ability to communicate, and the degree of care dependency at T1 were the strongest predictors of the follow-up ratings. The pattern of findings reveals that the Care Dependency Scale (CDS) is sensitive to care dependency increase after a 2-year period, and that the scale has utility in establishing longitudinal patterns of care dependency.

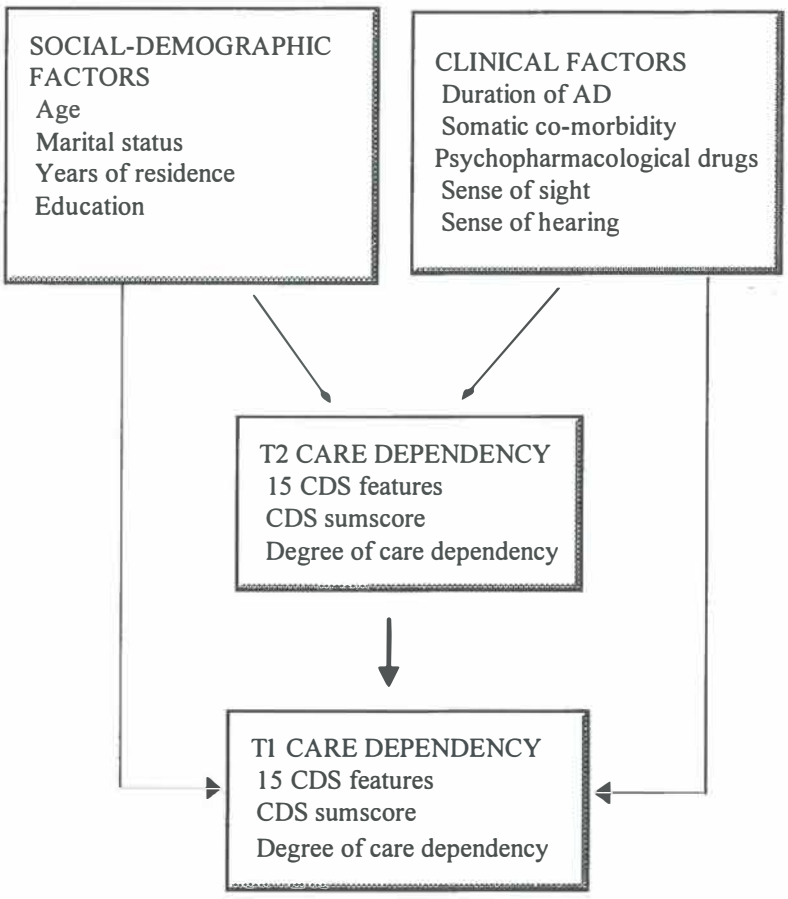
Introduction

Psychogeriatric nursing homes aim at patients with mental deteriorations, most of them with dementia (Schrijvers *et al.*, 1997). In the Netherlands there are 70 nursing homes, with a capacity of 25600 inpatient beds, in which psychogeriatric patients are admitted. These nursing homes provide long-term treatment which includes activities, such as care, treatment and therapy (National Hospitals Council, 1989; Schrijvers *et al.*, 1997).

This study explores the course of care dependency among patients with Alzheimer's disease (AD) who survived a 2-year period. It concerns nursing home patients whose physical, cognitive and social disabilities associated with AD have resulted in care dependency. These patients need continuous multidisciplinary treatment from nursing, medical, and psychological disciplines. Nurses regard the patient's care dependency as a process in which the patient's selfcare decreases and in which care demands make the person to a certain degree dependent on nursing care, which aims to restore the patient's independence in performing self-care. However, under the circumstances of being confronted with a chronic disease like dementia, it is questionable whether the nurse is able to guide the patient away from nursing care toward independent functioning without direct assistance.

In the present study the specified condition was the patient's care dependency, which was investigated in order to ascertain the long-term effects of those patients' dependency on care. Another aim was to assess the effects of related factors on the patients' care dependency. Professional and research literature suggest that dementia is partly due to increasing care dependency during the patient's stay in a long-term care facility (Clarke *et al.*, 1979; Maghid & Rhys Hearn, 1981; Donaldson *et al.*, 1983; Diesfeldt *et al.*, 1986; Cox *et al.*, 1993; Loewenstein *et al.*, 1995). This increase is related to various factors. As depicted in Figure 9, in this study these factors were grouped in social-demographic and clinical factors. Literature shows that social-demographic variables like age, years of residence, and education are factors related to decreasing values in patients' functioning (Palmore *et al.*, 1985; Kermis, 1986; Rocca & Amaducci, 1988; Schroll, 1988). Another social-demographic factor, one that reflects the family system, is the current marital status, which was determined by whether or not patients have a living partner. Clinical key factors are duration of Alzheimer's disease and somatic co-morbidity.

Figure 9 Research model and variables for analysis at study entry



Theoretically, it can be hypothesized that both factors influence patients' care dependency. Use of psychopharmacological drugs, whose sedative effects could lead to care dependency, has been mentioned by Maas *et al.* (1991) as a clinical factor affecting functional ability. Vision and hearing are factors which are known to decrease with age and limit independent functioning. Cartwright (1993) reported that there were age variations for the symptoms 'difficulty seeing' and 'difficulty hearing'.

Felson *et al.* (1989) reported that loss of vision brought about restrictions in patients' interactions with their environment and limited patients to go independently. Bess *et al.* (1989) associated loss of hearing with decreased functioning.

As Figure 9 suggests, social-demographic and clinical factors influence care dependency in the measurement at study entry in 1 April, 1994 (T1) and the follow-up measurement at the study endpoint after 2 years in 1 April, 1996 (T2); and care dependency at T1 influences care dependency at T2.

These assumptions were tested longitudinally. Another aim of this study was to assess the construct validity of the CDS. Summarized, the purpose of the study was formulated in four research questions:

1 To what extent does the patient's care dependency change in the 2-year interval?
2 How are both social-demographic and clinical factors at T1 connected with the difference score of the care dependency features at T2?
3 Which of the social-demographic and clinical factors, degree of care dependency, and CDS sumscore at T1 are the strongest predictors of the difference in degree of care dependency and CDS sumscore at T2?
4 Is the change in care dependency at two points in time adequately measured with the CDS in order to establish construct validity of the scale?

Methods

This research project was designed as a specific type of longitudinal study, namely a panel study. In panel studies the same subjects are used to supply data at two or more points in time (Polit & Hungler, 1991). Unlike cross-sectional correlation studies, panel studies have the major advantage of establishing a time-sequence among variables, so that patterns of change, reasons for the changes and causal relations can be inferred (Palmore *et al.*, 1985).

Subjects

The current study was undertaken in a single psychogeriatric nursing home in the northern part of the Netherlands which was willing to participate in the research project.

To follow the course of care dependency, from a previous study 68 female patients with the clinical diagnosis of Alzheimer's disease (AD) and who survived the 2-year period from study entry until study endpoint, were sampled in the panel.
The diagnosis of AD was made on the basis of the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) criteria for dementia (American Psychiatric Association, 1994).
At study entry, the panel consisted of 68 women, with a mean age of 82.6 (*SD* 6.0; median 83.0; range 66-95).
Their mean number of years of residence at study entry was 3.1 (*SD* 2.9; median 1.9; range 0-13); 3 patients had a partner and 65 had not. In the sample, 68% of the patients had little school education.

Instrumentation

Both at T1 and at T2, a questionnaire was administered to the patients in the panel. The questionnaire contained three separate instruments: the Care Dependency Scale (CDS), the Rating Scale for Elderly Patients (RSEP), and the SIG Verpleeghuis Informatie Systeem (SIVIS).
The first scale provides a framework for the care dependency status of demented elderly in-patients. The CDS measures 15 human needs: eating and drinking, incontinence, body posture, mobility, day/night pattern, getting dressed and undressed, body temperature, hygiene, avoidance of danger, communication, contact with others, sense of rules and values, daily activities, recreational activities and learning ability. Its last question asks for a specific rating of the degree of care dependency on a 5-point Likert-scale, ranging from 1 for completely dependent to 5 for almost independent. The CDS has been psychometrically tested in four studies. Content validity was established by 44 experts in a Delphi survey (Dijkstra *et al.*, 1996b). Reliability was documented (interrater reliability (K) .40 to .64; test-retest reliability (K) .55 to .80; Cronbach's Alpha .97) (Diepenmaat *et al.*, 1994). Factor analysis was carried out and resulted in a one-factor solution (Eigenvalue 10.721). In addition, Mokken scale analysis resulted for the whole scale in a high H-coefficient, .75 (Dijkstra *et al.*, 1996a). In a fourth study criterion-related validity was examined (Dijkstra *et al.*, in press[c]).
The second instrument is the Rating Scale for Elderly Patients, which is a Dutch version of the Stockton Geriatric Rating Scale (Meer & Baker, 1966; Van der Kam *et al.*, 1971).

The scale contains 35 aspects of patients' daily behaviour. Six subscales were constructed: helplessness, aggressivity, mental disability, depressive behaviour, physical disability, and inactivity. The nurse assesses the severity of impairment of each item on a three-point rating scale.

The Rating Scale for Elderly Patients was psychometrically tested in a large number of studies (Diesfeldt, 1981).

In the original study, in which the SGRS was modified and developed into the Rating Scale for Elderly Patients and 965 patients were involved, an account was given of construct validity (factor analysis and discriminant validity) and reliability research (Van der Kam *et al.*, 1971).

Factor analysis resulted in constructing 6 subscales. Internal consistency of the subscales (.74 to .94) and the inter-rater reliability (.74) were generally adequate.

The third instrument in the questionnaire is a national registration system of medical, nursing and demographic data of Dutch nursing home patients (SIG, 1994). The care items of the SIVIS are rated by nurses or nurse aides.

Van Drunen and Van Montfort (1981) describe the way in which 12 patient variables of the nursing categories ADL, mobility, continence and communication were developed and psychometrically tested. Using Mokken scale analysis, they found for the whole scale a H-coefficient .63 (n=36721). Hoppenbrouwer (1994), using the SIVIS instrument on a psychogeriatric ward (n=87), found in his study moderate to almost perfect Kappa values for the interrater reliability.

Construct validity

Construct validity is the degree to which an instrument measures the construct under investigation (Polit & Hungler, 1991). In this study, construct validity was established by examining relationships, based on the fact that constructs can be explicated in terms of another concept. As a similar concept to the CDS sumscore the RSEP subscale 'helplessness' was used, and as a similar concept to the degree of care dependency the variable 'group classification' was used. The train of thought was as follows. The construct of care dependency is positively related to the construct of helplessness. Accordingly, the CDS and the RSEP subscale of helplessness are both measures of the same construct of dependency.

So, the scores on both instruments will be correlated positively and show the same pattern of increasing dependency, as predicted by the relationship between both constructs. Therefore, it can be inferred that the CDS and the RSEP subscale of helplessness are both valid measures of the same underlying constructs of dependency and helplessness.
The same train of thought can be followed for the related variables 'degree of care dependency' and 'group classification'.

Procedure

Patients were followed during a two-year period. Each patient both from T1 and T2 was administered through the earlier mentioned questionnaire. The ratings were carried out by the nurses or nurse aides who were most involved in the daily care of the patient concerned and who were familiar with the use of the three instruments. Filling out the three instruments took about half an hour. To ensure the patients' privacy, the names of the participants were encoded.
Social-demographic information on age, years of residence, and marital status was obtained from the patient's demographic record of the SIG Verpleeghuis Informatie Systeem (SIVIS) at T1.
Supplemental social-demographic information on education and clinical information on duration of AD, somatic co-morbidity, and the use of psychopharmacological drugs were found retrospectively in the patient's medical care plan at T1. Data about sense of sight and sense of hearing were gained by ratings from the SIVIS at T1.
For somatic co-morbidity nine categories were composed: (1) cerebrovascular diseases, (2) cardiovascular diseases, (3) pulmonary disorders, (4) musculoskeletal problems, (5) endocrine disorders, (6) malignancies, (7) urinary disorder, (8) gastro-intestinal disorders, and (9) cachexia and dehydration.
The features of care dependency at study entry and at study endpoint were measured on basis of the 15 items and the degree of care dependency from the CDS scale. The CDS sumscore was computed by adding the 15 items of care dependency.
To investigate construct validity, one subscale of the Rating Scale for Elderly Patients was filled out in this study: helplessness (sumscore of 23 items). The helplessness sumscore was obtained at T1 and at T2. With the helplessness sumscore the variable 'group classification' could be computed.

These groups, which are based on the 'Dutch Nieuw Toutenburg classification', represent three categories: 'aged people requiring nursing guidance', 'aged people requiring nursing care' and 'aged people requiring intensive nursing care' (Sipsma, 1970; Wimmers, 1976). This classification is a very useful working-model that is frequently used in the care of demented in-patients in the Netherlands.

Statistics

Data were analysed using the Statistical Package for Social Sciences Windows version 7.5. (SPSS, 1997). The Frequencies procedure was used to provide statistics on range, mean and standard deviation. The Wilcoxon signed-rank test was used to provide information about the significance of the difference score between care dependency at T1 and T2. Furthermore, Pearson's correlation coefficients were computed between the patient's demographic and clinical factors on the one hand and the 15 CDS items, the CDS sumscore, and the degree of care dependency on the other.
Finally, using stepwise regression analyses in which the independent variables were forced into the equation, the separate contribution of these variables to the degree of care dependency and the CDS sumscore was determined.

Results

Changes in care dependency

The first question to deal with was: do patients with AD get more dependent on nursing care as they age, and if so, what is the average rate of this increase, and which dimensions of care dependency increase more than others? To assess these issues a difference score (T2 minus T1) was computed.
Table 28 reveals the means and mean changes at T1 and at T2, and the mean difference scores between T1 and T2 for the 15 dimensions of care dependency during a 2-year period. Except mobility, all the other 14 CDS-dimensions indicated an increase in dependency on nursing care. The strongest decline of patient's independency was found on daily activities.
Wilcoxon Signed Rank Test was used to determine whether there was a significant difference between the 15 CDS scores in 1994 and 1996, respectively.

It can be concluded that there is a statistically significant increase of dependency in 14 of the 15 CDS items. In addition, the same pattern was observed on the CDS sumscore and the degree of care dependency, indicating that two years of longer residence have a significant effect in the increase of the patient's dependency.

Table 28 Care Dependency: mean changes in T1 (1994) and T2 (1996), and differences (T2 minus T1) (n = 68)

CDS-items	T1		T2		T2-T1		Wilcoxon
	$\bar{x}$	*SD*	$\bar{x}$	SD	$\bar{x}$	*SD*	$p<.05$
Eating and drinking	2.62	1.22	1.99	1.19	-.73	1.02	**
Incontinence	2.59	1.58	1.65	1.19	-.94	1.23	**
Body posture	3.37	1.46	2.21	1.43	-1.12	1.14	**
Communication	3.34	1.67	2.34	1.30	-1.00	1.70	**
Day/night pattern	2.76	1.40	2.28	1.23	-.49	1.44	**
Getting (un)dressed	2.15	1.42	1.47	1.01	-.68	1.04	**
Body temperature	2.47	1.39	1.72	1.05	-.75	1.10	**
Hygiene	2.18	1.23	1.43	.90	-.75	.95	**
Avoidance of danger	2.10	1.36	1.53	1.09	-.57	1.14	**
Daily activities	3.04	1.46	1.37	.77	-1.68	1.26	**
Contact with others	2.25	1.31	1.53	.91	-.72	1.12	**
Sense of rules/values	2.09	1.41	1.40	.87	-.69	1.12	**
Mobility	2.04	1.31	2.19	1.63	.15	1.00	ns
Recreational activities	1.93	1.12	1.40	.87	-.53	.98	**
Learning ability	1.76	.98	1.22	.51	-.54	.80	**
CDS sumscore	36.65	17.54	25.71	13.11	-11.37	10.73	**
Degree of care depend.	2.26	1.30	1.49	.78	-.78	.91	**
Helplessness sumscore	23.59	10.70	30.87	6.97	7.21	7.87	**
Group classification	2.06	.77	2.63	.57	.54	.58	**

Connectors with care dependency

The second research question was first concerned with the question whether the 15 items of care dependency, the CDS sumscore, and the degree of care dependency obtained from the difference score (T2 minus T1) were connected with the social-demographic and clinical factors measured at T1.

Table 29 presents the significant bivariate correlations between the concerning variables measured at T1 and the difference score of the care dependency items, the CDS sumscore, and the degree of care dependency. It reveals that age had less effect on the difference score of the CDS variables.

Table 29 Significant predictors of care dependency difference scores: Pearson correlation coefficients ($n = 68$)

Predictors 1994	**Difference score (T2 minus T1) Features of care dependency#)**																
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**Degr dep.**	**Sc**
Age				.29*				.26*									
Years of residence	.32	.30*	.28*		.36	.36		.45		.36	.31*			.25*	.29*	.36	
Duration of AD	.26*				.32	.36		.36	.27*	.38	.26*	.31*			.27*	.25*	
Psychopharm. drugs	.33																
Sense of sight						.24*		.28*		24*		.27*					
Somatic co-morbid:																	
-Cerebrovascular													.27*				
-Cardiovascular				-.28*		-.29*											
-Musculoskeletal			-.26*										-.36				
-Malignancy					.24*												
-Urinary disorder	.28*																
-Cachexia/dehydrat.														.27*			
CDS sumscore	-.34	-.33			-.31*	-.59	-.52	.63	-.43	-.59	-.57	-.67		-.45	-.63	-.66	-.
Degree of care dep.	-.30*	-.27*				-.43	-.50	-.52	-.35	-.47	-.48	-.58		-.44	-.62	-.80	-.
Helplessness	.32	.42			.35	.59	.49	.57	.42	.58	.54	.61		.43	.55	.59	
Group classification	.31	.42		.24*	.43	.53	.42	.49	.40	.55	.45	.55		.40	.44	.56	

#) For description of the 15 CDS features see Table 28

*) Correlation is significant at the .05 level (2-tailed), all other correlations are significant at the .01 level (2-tailed)

Years of residence and duration of AD were significant predictors for almost all of the T2 CDS ratings.

Further, six out of the nine somatic co-morbidity categories, psychopharmacological drugs, and sense of sight gave significant correlations for, mostly, one of the difference scores on the CDS ratings.

In addition, Pearson correlation coefficients were computed between the CDS sumscore and the degree of care dependency at T1 on the one hand and the 15 care dependency items, the degree of care dependency, and the CDS sumscore obtained from the difference score (T2 minus T1) on the other (see also Table 29).

As expected, both T1 variables correlated significantly with most of the mentioned T2 CDS ratings.

Finally, Pearson correlation coefficients were computed between the 15 CDS features at T1, and the CDS sumscore and the degree of care dependency obtained from the difference score (T2 minus T1) (see Table 30). As expected, significant correlations were found between all 15 CDS features at T1 and both T2 CDS ratings.

Table 30 Significant predictors of care dependency difference scores: Pearson correlation coefficients ($n = 68$)

Predictors	**Difference score (T2 minus T1)**	
1994	**CDS Sumscore**	**Degree of Care Dependency**
Eating and drinking	-.62	-.57
Incontinence	-.55	-.51
Body posture	-.61	-.54
Communication	-.57	-.46
Day/night pattern	-.52	-.49
Getting dressed and undressed	-.62	-.62
Body temperature	-.60	-.65
Hygiene	-.58	-.62
Avoidance of danger	-.62	-.67
Daily activities	-.55	-.53
Contact with others	-.65	-.65
Sense of rules and values	-.59	-.58
Mobility	-.58	-.61
Recreational activities	-.56	-.59
Learning ability	-.36	-.54

All correlations significant at the .01 level (2-tailed)

Predictors of care dependency

To test the third research question which of the variables measured at T1 are the strongest predictors of care dependency at T2, a regression analysis was conducted. In line with the previous research, only those variables from T1 which were statistically significant in the correlation matrix shown in Table 29 and Table 30, were included as independent variables. As the CDS sumscore at T1 is a plus sum of the separate 15 CDS features, this variable was excluded as an independent variable in the analysis.

Both the CDS sumscore and the degree of care dependency were chosen as dependent variables as they were obtained from the difference in ratings (T2 minus T1). The possible interaction effects between both dependent and independent variables were entered into a stepwise procedure, with a criterion for entry set at the .05 level of significance. Table 31 presents the findings of the regression analysis. Only those variables are shown that added a statistically significant increase ($p<.05$) to the variance explained.

As Table 31 shows, differences in the CDS sumscore were predicted independently by 2 CDS features, contact with others and communication, accounting for 38.78% and 4.5% of the variance, respectively.

This means that a high score on T1 predicts a substantial increase in care dependency, whereas a low score on T1 hardly predicts a change in the state of care dependency.

The 1994 degree of care dependency was the most powerful predictor for the difference in degree of care dependency at T2, it accounted for 63% of the total variation. A high score on T1 means a considerable change in the future degree of care dependency. Cardiovascular disease and getting dressed and undressed added another 2.2% and 2% to the variance, respectively.

Table 31 Significant predictors at study entry of the difference in CDS sumscore (T2-T1) and Degree of Care Dependency (T2-T1): regression analysis

	Beta	Adjusted R^2
CDS sumscore:		
Contact with others	-.48	.387
Communication	-.27	.432
Degree of Care Dependency:		
Degree of care dependency	-1.05	.625
Cardiovascular disease	-.21	.647
Getting dressed and undressed	.30	.667

Construct validity

To examine construct validity, analyses were carried out on the RSEP subscale 'helplessness' and on group classification. For both variables, the same pattern (increasing dependency on difference score and significance) was found as for the CDS sumscore and the degree of care dependency (see Table 28). Furthermore, analyses were carried out in order to establish Pearson correlation coefficients between the RSEP subscale of helplessness and group classification at T1 on the one hand and the difference score, T2 minus T1, on the CDS features on the other. The significant bivariate correlations are presented in Table 29. Comparing the outcomes depicted in Table 2 with the corresponding results in Table 29 regarding the CDS measures, CDS sumscore, and degree of care dependency, the same picture was found: on almost all the same CDS features a comparable pattern of significance was found.

Discussion

Main findings

The descriptive findings highlight that care dependency increases significantly after a 2-year period, but the differences in the degree of increase on the separate items contradict the view of a general increase in care dependency.

From the cross-sectional findings, it may be concluded that most of the social-demographic and clinical variables play a less dominant role in predicting care dependency than the CDS features. As far as clinical variables influence the patient's dependency on care, the effect is almost only related to the cross-sectional findings. Strong correlations have been found on the T1 factors 'CDS sumscore' and 'degree of care dependency', and the related RSEP variables 'helplessness sumscore' and 'group classification'.

Another picture emerges from regression analysis. As can be seen in Table 31, despite the findings of significant coefficients in the bivariate analysis, no other factors than 4 CDS features and 1 somatic co-morbidity variable from study entry seem to make a significant independent difference in CDS sumscore and degree of care dependency, both at T2. It can be concluded, that the other factors may be causally related to the T2 CDS ratings, but that they do not have any independent or only a weak effect on the difference in care dependency between T1 and T2.

The finding that the strongest predictors of the CDS sumscore at T2 were 'contact with others' and 'communication', shows that the loss of social relationships and the loss of ability to communicate put patients in a position to become more dependent on nursing care.

The finding that the degree of care dependency accounted for 63% of the variance in the same variable two years later suggests that, although further study and replication are certainly needed, a fairly valid prediction can be made on the basis of this factor not only for the determination of individual care dependency, but also for the classification of patients' groups as to the degree of their dependency on care.

The fact that cardiovascular disease predicts the degree of care dependency at T2 may reflect the importance of this co-morbidity factor on nursing care. Although the cardiovascular system becomes less efficient with age, these changes make patients vulnerable to increasing care dependency.

The finding that 'getting dressed and undressed' proved to be a significant predictor of the degree of dependency in the bivariate analysis, and that it remained a significant predictor in the regression analysis, shows that as dementia progresses decreased ability to carry out motor activities can accelerate dependency.

An interesting point can be made on age.

Although, in the public mind, dependency is closely associated with age (Johnson, 1993), neither in the bivariate analysis in this study nor in the regression analysis, age appeared to be a factor of significance. This result is in accordance with the findings of Jirovec and Kasno (1993), who predicted self-care abilities among institutionalized elderly. Thus, the assumption that age means dependency had to be revised.

Main implications

Outcomes of the CDS assessment offer nurses insight into the patient's potentialities for selfcare and may help nurses to decrease care dependency in the long term. Although the findings show an increase in care dependency on almost all the CDS features, early interventions may be successful in decreasing or stabilizing the level of dependency, especially when patients have a high CDS sumscore at the time of admission.

The practical implications of this phenomenon may not only be a better understanding of the ongoing process of care dependency, but also a greater opportunities for nurses to plan interventions in the early phases of a patient's admission in order to prevent further loss of independence.

Some remarks can be made with respect to the methodological aspect of this study. The sample was limited to patients from one particular nursing home and to those who stayed alive within the research period. Further, Palmore and colleagues (1985) argued in their study that the weakness of bivariate analysis is 'that we do not know which and how many of the associations are independent of the other factor'. For that reason, and because of the fact that in this study some reported correlations, though statistically significant, a form of regression analysis was used.

A last remark is about the so-called 'ceiling-effect'. This effect refers to a limit in the range of scores of a measure (Kazdin, 1992). From patients with a minimum score on the CDS features at T1 (high degree of care dependency), an equally low score is to be expected at T2. Crosstabulation (not presented) of the variables to diagnose the degree of care dependency and group classification revealed a doubling of the number of patients who were already completely dependent at T1.

This is in accordance with the general idea of the existence of AD-subtypes and variability in the course of dementia.

The approach to establish construct validation by examining relationships, based on the positively related constructs of dependency and helplessness, gave evidence to the construct validity of the underlying concept of the CDS. The results of the bivariate analysis show a corresponding result for both instruments in measuring the construct dependency. The findings have enlarged confidence in the assumptions that the CDS is sensitive to measuring an increase in care dependency longitudinally, and that the CDS is a promising instrument for studies among institutionalized demented patients.

10 Summary and Discussion

Ate Dijkstra

Introduction

This thesis presents a series of studies about the application of the care dependency concept to nursing research and to the field of long-term care practice. Each of these studies contains one aspect of the aim of this research project. The key questions of the project focus on analysing and clarifying the meaning of the concept of nursing-care dependency, on developing an instrument to assess the patient's dependency on nursing care, on determining the psychometric properties of the instrument, and on investigating the practical significance of the instrument. The study is reported in eight chapters, which were written as articles for Journals. Underneath, each chapter is summarized and the findings concerning the aforementioned research questions are discussed. This chapter concludes with some recommendations for further research.

Summary

The first chapter gives a general outline of the rationale and the research objectives on which this study was based. The research objectives were:

1 To analyse and clarify the meaning of the concept 'dependency', in this thesis defined as 'nursing-care dependency', for use in the nursing practice of long-term care facilities.
2 To develop an instrument to assess the patient's dependency on nursing care in long-term care facilities, and to determine the psychometric properties of the instrument.
3 To investigate the clinical significance of the instrument.

Chapter 2 reports about the operationalization of the Nursing-Care Dependency (NCD) concept. On the basis of a literature survey, the meaning of the concept of dependency as well as the relationship between the dependency concept and nursing care was discussed.

Additionally, a frame of reference for nursing-care dependency was developed and a theoretical definition of nursing-care dependency was stated. A second literature survey led to a framework which was useful in specifying the variable properties of the nursing-care dependency concept as established in the theoretical definition. Henderson's framework consisting of 14 components of nursing care was translated into 14 nursing-care dependency items.
In Chapter 3, a further account is given of the development and content validity of an instrument assessing nursing-care dependency. By means of a Delphi survey, it was determined whether the 14 separate items, item descriptions, and item criteria adequately represent the content of nursing-care dependency. Henderson's 14 human needs appeared useful, and supplied a basis for the ultimate model of the assessment instrument. In general, the panellists' comments were consistent with the literature on Henderson's original list of human needs. Only one item, 'communication', was added to Henderson's original frame of 14 human needs. It was argued that the 15 NCD items represent a textually clear and comprehensible list of NCD features. It was remarkable, that panellists from psychogeriatric nursing homes as well as from institutions of the mentally handicapped did not differ fundamentally in their opinion, so that for each group of patients an identical structure in content regarding NCD items, their item descriptions, and criteria could be developed. Besides these clinical versions, which will be used for routine assessments and diagnostics within the framework of the nursing process, a research version of the NCD instrument was developed. This version is intended for use in those situations in which an approximate assessment of care dependency is sufficient or for academic research. The clinical and research versions are identical with regard to the 15 care dependency items and the accompanying item descriptions. Both versions differ in the way nursing-care dependency is assessed. In the version which is applicable to use in research, the degree of care dependency is assessed on a five-point Likert-scale. The version for use in practice required a judgment of care dependency by selecting one criterion out of five written criteria. For both versions, a NCD sumscore could be computed by adding the item scores of the 15 items. The theoretical range for the NCD sumscore will be from 0 till 75; the higher the score, the less dependent on nursing care. A 16th question was added to the two versions of the scale.

This question asks for a specific rating of the degree of the patient's dependency on a 5-point Likert-scale ranging from 1 for completely dependent to 5 for almost independent of nursing care.
On the based of the findings of the previous chapters, chapters 4, 5, and 6 deal with the psychometric testing of the clinical version of the NCD instrument to assess patient's dependency on nursing care. Chapter 4 was designed to study the reliability and utility of the NCD instrument analysed in two samples: patients living in psychogeriatric nursing homes and patients living in institutions for the mentally handicapped. Three aspects of reliability were investigated. In terms of internal consistency, Cronbach's alphas that were found were high enough to use the NCD instrument in clinical practice, both on a group and an individual level. The second focus in the reliability assessment was on establishing equivalence among observers on rating behaviour, which was tested by interrater reliability procedures. Here, reliability of the NCD instrument on item level gave a moderate to substantial interrater reliability. The third aspect of the NCD scale's reliability was the stability aspect, which was evaluated by test-retest procedures. For all items, the test-retest reliability was moderate to substantial. Concerning the usefulness of the instrument in practice, it could be concluded that both the instructions and the criteria to choose from were evaluated by the raters as clear and understandable. Chapter 5 describes the results of a study determining construct validity of the NCD instrument. Construct validity in this study was analysed by Factor analysis and Mokken scale analysis. Findings from Factor analysis revealed that the individual items represent one dimension of care dependency. Mokkenscale analysis gave a high H-coefficient, which implied a strong hierarchical scale. Therefore, the separate NCD item scores could be added. Besides, it is statistically acceptable that patients with both an identical sumscore and the same items, are equally dependent on care. The psychometric attributes of the NCD instrument that were found in this study were such that it is justifiable to speak of an NCD scale. Further it was notable, that the internal consistency of the NCD scale gave again Cronbach's alpha statistics higher than .90. Therefore, it could be concluded that the scale can be used for making group level comparisons as well as for making decisions about individuals. Also in this study, the research version of the NCD instrument was validated with corresponding statistic results on internal consistency, Factor analysis and Mokkenscale analysis in comparison with the clinical version.

In Chapter 6, the criterion-related validity of the NCD scale was investigated by studying the relationship between the Nursing-Care Dependency scale, the Rating Scale for Elderly Patients (RSEP), the Behaviour Observation Scale for Intramural Psychogeriatrics (BOSIP) and the Scale for Social Functioning (SSF). Two types of criterion-related validity were applied: convergent validity and discriminant validity. High correlations were found between NCD and four RSEP subscales, and NCD and SSF, which means convergent validity. There was a low relationship between the NCD sumscore and BOSIP subscales-scores. Investigation into the differentiating power made it clear that the NCD scale offers an adequate possibility for classifying demented patient groups in nursing homes, according to the so-called 'Nieuw Toutenburg classification'.

Chapter 7 contains the presentation of an international study which aims to assess similarities in psychometric properties of the NCD scale and to determine whether the NCD scale scores were comparable across the countries involved. From four countries NCD data of patients with dementia were available. Psychometric evaluation of the NCD scale for each country separately and for the four countries simultaneously was carried out. Like most cross-cultural research, this study was designed to identify similarities in reliability and validity aspects for the Dutch, English, Italian and Norwegian versions of the NCD scale and to assess whether the NCD scale scores were comparable across the countries. Taking the results together, findings showed that the NCD scale may be useful in measuring nursing-care dependency in each country as well as across the four countries on a group and an individual level. Furthermore, the NCD sumscore can be used safely as an overall indicator of nursing-care dependency. Besides, the NCD scale items proved to be related to fundamental human needs which appear in every patient-nurse relationship independent of cultural background. Although further research is needed, there is evidence that the NCD scale can be used for international comparison and can contribute to the development of international standards for nursing need assessment of patients with dementia.

Chapter 8 and 9 deal with the clinical significance of the instrument in psychogeriatrics. During a 2-years-period a psychogeriatric nursing home population was examined twice.

The questionnaire that was used included the NCD scale. Data obtained from this longitudinal study were used in two studies. Chapter 8 considers the relationship between the severity of patient's nursing-care dependency on the one hand and causes of death, co-morbidity and survival on the other. Therefore, two subsamples were formed, based on the median score of the NCD scale. One subsample could be typified as severely dependent and the other subsample could be characterised as mildly dependent. At study entry, both subsamples differed significantly on duration of Alzheimer's disease, duration of admission, and on all nursing-care dependency features, however, the two subsamples did not differ significantly on age, age at onset of Alzheimer's disease, and co-morbidity. In both groups, the main causes of death were cachexia and/or dehydration. The study showed that survival prognosis varies with the level of nursing-care dependency. Compared to those with mild dependency, patients with severe dependency showed an excess mortality of 20%. The findings from the analysis to predict survival could be categorized in the demographic factor 'marital status', the social-economic factor 'education', the medical factor 'cardiovascular disease' and the following four nursing factors: body posture, day/night pattern, communication and contact with others. It is unclear whether the patient group studied is representative of the total population of Alzheimer patients.

Chapter 9 presents a study to investigate longitudinal changes and differences in patients' nursing-care dependency. As possible predictors of care dependency, social-demographic and clinical factors were also included into the research design. Descriptive statistics indicated an increase in almost all 15 features of dependency over a 2-year period. The loss of social relationships, the loss of the ability to communicate, and the degree of nursing-care dependency at T1 were the strongest predictors of the follow-up ratings. An interesting conclusion was that age did not appear to be a significant factor. The pattern of findings revealed that the NCD scale is sensitive to nursing-care dependency increase after a 2-year period, and that the scale has utility in establishing longitudinal patterns of nursing-care dependency.

Discussions

It can be discussed to what extent the aims of this study have been achieved.

With regard to the first research question, which was to analyse and to clarify the meaning of dependency (see chapter 2), it may be concluded that the thesis has brought forward a new frame of reference for dependency. On the basis of an earlier Dutch study (Van den Heuvel, 1976), the meaning of dependency was refined and placed in a care context. Therefore, the new frame of reference may be seen as a relevant supplement to existing knowledge about the concept of dependency. However, it can be discussed if the title 'nursing-care dependency' for the core concept is right. From the patient's perspective, is it a matter of 'being dependent on nursing care' or should the concept be placed in a broader perspective of 'being dependent on the care of several health professionals'? In other words, is the assessment of care dependency a unidisciplinary affair or is a multidisciplinary assessment preferable? The main reason for choosing the term 'nursing-care dependency' at the beginning of the research project was based on the fact that one of the daily tasks of nurses is 'to observe patients' needs'. As nursing is the only discipline that gives a twenty-four hour a day, 7-days-a-week service, nurses are par excellence the ears and the eyes to assess the patients' needs and care demands. Another reason for the naming the core concept 'nursing-care dependency' was that, after admission in long-term care facilities, patients are to a certain degree dependent on nursing care, because of the decrease in self-care capabilities. For these reasons, the concept to be explored and the instrument to be developed was named 'nursing-care dependency'. After discussion this concept during an invitational conference[4], it was decided to place care dependency in a broader perspective.

[4] This invitational conference was held at Leeuwarden on 12 - 14 November 1997. Researchers were invited who participated in the international NCD research programme. The conference aimed to network with researchers from Germany, Italy, the Netherlands, Norway, Sweden and the United Kingdom, discuss the underlying concept of the NCD scale, exchange research findings, and make a major contribution to further research and practical use.

Care dependency is a generalist subject, therefore, it is necessary to utilize the knowledge of many professional health care disciplines to achieve a high degree of independent patient functioning. In the frame of reference presented in Chapter 2, the professional system is too much confined to the nursing discipline. However, on all the aspects assessed by the 'NCD scale' the patient's need for care is comprehensive. Therefore, a higher quality of patient care called for a multidisciplinary collaboration.

So, it was suggested to speak in future about the 'Care Dependency Scale (CDS)' as an multidisciplinary assessment instrument. This new name expresses the multidisciplinary approach and will from now on be used in this thesis. This does not mean that nurses are going to play a less dominant role in future assessments of patients' care dependency. On the contrary, the nurse contribution in the assessment procedure is no subject of debate. With the outcomes of the CDS assessment in mind, the ability of the nurse to interact effectively with other professionals and to make a more meaningful contribution to the decisions of the multidisciplinary team will increase. Besides, the fact that the responsibility for the care dependency assessment is not limited to one discipline makes it possible for other disciplines to react from their own professional backgrounds to the outcomes of nursing assessments, in order to formulate a multidisciplinary treatment programme.

Another subject of discussion concerns Henderson's human needs theory. Although choosing Henderson's ideas about human needs instead of, for example, Abdellah's model of 21 nursing problems or Orem's Self-Care Deficit Theory can be discussed, the results of this study demonstrate that Henderson's components of (nursing) care can empirically be tested within (inter)national long-term care facilities. Henderson's human needs framework has not only structured and focused the thinking about developing the CDS, in this study Henderson's components of basic care are also operationalized in measurable criteria to determine the degree in which patients are dependent on care. Besides, a new component was added to Henderson's original list of 14 human needs, which might refine Henderson's human needs framework. So, results of this study have generated new insights in the utility, theoretical as well as practical, of Henderson's model of human needs.

With the concept of care dependency in mind and because the patient's level of dependency had to be measured, it was important to know whether the development of an instrument to assess the patient's dependency on care and the determination of the psychometric properties of the instrument was possible. This second research question was answered in terms of content validity, reliability, construct validity and criterion-related validity of the CDS (see chapters 3 to 7). Based on the opinion of nurses who participated in the Delphi survey, it may be concluded that a content valid instrument to assess care dependency has been developed.
Besides, the outcomes of three psychometric studies confirm that the instrument is reliable and valid for assessing patient's dependency on care for use in long-term care facilities, in particular in psychogeriatric nursing homes and in institutions for the mentally handicapped. Further, the fact that the Dutch CDS has been translated and tested in Canada, Italy, and Norway with results almost similar to those found in the original Dutch studies, gives satisfaction and support to the reliability and validity of the Dutch findings. So the second research question may be answered positively and successfully.
In the international study (chapter 7) some remarks were made about the differences in care dependency between the four countries. The findings (see Table 20) show that Dutch patients were somewhat less care dependent than Canadian, Italian and Norwegian patients. It is known that in the early to mid-1980s elderly people in the Netherlands more often lived in an institution than in other Western countries (Schrijvers *et al.*, 1997). An explanation for this can be found in the large number of institutional facilities for the elderly and a low threshold for admission. Nowadays the goal of Dutch health care policy is to keep old persons independent in their own environment as long as possible. Although admission to residential and nursing home care is postponed because of the increased availability of home care and other services (Schrijvers *et al.*, 1997), it seems that the admission criteria indicating when a elderly person needs institutional care, have not changed since the early to mid-1980s.
On the basis of the outcomes of the aforementioned studies with regard to reliability, content validity, construct validity and criterion-related validity, the following practical implications for the Dutch CDS can be formulated.

First, a tested, reliable and valid instrument is available for assessing patient's (dis)abilities by expending attention to the patient's capabilities to perform self care in a more systematic way. Besides, a research version of the CDS was designed for use as a service evaluation instrument. Further, a clinical version of the CDS will be used as a routine instrument for initial assessments. It provides basic information about the patient's needs and degree of care dependency for multidisciplinary use. Both scales can be used for making group level comparisons as well as for making decisions about individuals.
A subject of discussion is the question how to measure care dependency features. The question is, does the rater assess the actual or the potential abilities concerning the patient's dependency on care? The difference between the two views is that actual abilities imply a problem-oriented approach aimed at the patient's problems or complains here and now, whereas emphasis on potential abilities leads to a development-oriented approach, based on the patient's needs and wishes the future. The aim of the assessment is to determine the patient's potential for future self care. Professionals have to determine the patient's potential because their diagnoses, objectives and interventions should aim to enlarge the patient's ability to cope. Therefore, the CDS requires a judgment of the patient's ability instead of a measurement what the patient is actually doing here and now.
With respect to the third research question, the clinical significance of the CDS was examined in a two-year follow-up study (see chapters 8 and 9). For the provision of individual care and for policy purposes, it is relevant to know which individual characteristics have an impact on and predict care dependency. The first study led to the insight that there are at least four important CDS items with respect to the relationship between survival prognosis and the patient's level of care dependency. These are (1) 'body posture' and 'day-night pattern' in the explanation of the relationship between physical disabilities in carrying out tasks and survival, and (2) 'communication' and 'contact with others' in the explanation of how the patient's social functioning is associated with survival. The main finding of the second study confirms again the importance of 'communication' and 'contact with others' to explain the longitudinal changes and differences in the patient's care dependency status.

A remarkable aspect of this study the patient's social functioning, expressed in the CDS features 'communication', which was added by the panellists in the Delphi survey and which constitutes the 15th item, and 'contact with others', which raised questions about what it means to be socially dependent. Kitwood and Bredin (1992) state that a person can only exist in relationships with others and Beoniel *et al.* (1980) define social dependency as the state in which patients require help or assistance from others in performing daily activities or roles that, under ordinary circumstances, persons can perform by themselves. In this context the following conditions are essential. A person has to be able to communicate and to make, maintain and end social contacts, but also the presence of a significant other is of crucial importance. An important problem for the elderly is the disturbance of this balance of social functioning. The loss of a partner, expressed in the variable 'marital status', exerts influence on longevity (see chapter 8).

Besides, the loss of the ability to communicate and the loss of social relationships put patients in a position of becoming more dependent on significant others in performing self care activities (see chapter 9).

Another remarkable fact is that the aforementioned findings suggest that social functioning may contribute to the risk of care dependency. It is likely, therefore, that a useful assessment instrument, one that can identify a sizable proportion of care dependency risks for patients, will need to include features of social functioning. Because the CDS meets these requirements, it may be useful as part of a comprehensive assessment determining patients' risks of losing selfcare ability.

A last subject of discussion concerns the question which implications the findings of this study have for health care policy. According to Challis *et al.* (1996), assessment nowadays is clearly linked to the development of effective care policies. Study results show that the CDS appears to be a reliable and valid tool for assessing the patient's care needs. Therefore, it may be expected that, in developing their care policy, long-term care institutions will use the CDS as an instrument to assess and categorise the patient's needs and problems after admission to an institution, and reassess these needs at regular intervals or when a significant change occurs in the patient's dependency status. But the CDS has the power to offer more. The outcomes of the CDS assessment can be linked to the multidisciplinary care planning and treatment process. Further, study results show that the CDS has the power of classifying patient groups.

Another aspect with regard to care policy is that, in the last few years, policy making on governmental level and by umbrella care organizations has increasingly been attached to the independence of institutionalized patients and to their care demands and wishes, concisely expressed in the slogan 'care-to-standard'. The consequence of the earlier mentioned statement that a person can only exist in relationships, is that this relationship brings the patient and the caregiver into a single frame (Kitwood & Brdin, 1992). But how to prevent, within this frame, development of that dependency and care needs, and by what means are the patient's needs and wishes assessed? If 'care-to-standard' is taken as an objective, an explicit choice in institutional care policy should be made between a problem-oriented system or a development-oriented care system. Characteristic of the problem-oriented system is that it focuses on the patient's problem which brings the patient and the professional caregiver together, and that this relationship ends when the problem is solved. The development-oriented care system, however, implies an interdependent frame in which there is an interaction-situation between patient and caregiver. Nurses and other health care professionals determine the ways out of dependency back into independency on the basis of the patient's needs and wishes. Here, the goal for care policy is to keep the patient independent as long as possible and to make the patient's life as normal as possible, by stimulating their potential and not by solving problems, because the latter makes patients dependent. Professional interventions are also aimed at prevention and reactivation. Nurses and other health care professionals who practise according to this development-oriented concept, must know how to assess the patient's need for help in their daily functioning. Consequently, in this study the idea of 'care-to-standard' and thinking in terms of development, instead of thinking in terms of disease, disorders, and impairments - summarized in the word 'problems' -, were brought together in developing the structure of an assessment instrument. The availability of a reliable and valid instrument, such as the CDS, represents a step forward towards assessing patients' care demands and needs, not as a problem but as an opportunity for development into an independent functioning person as described by Henderson (1966) and Beoniel (1980).
In conclusion: with regard to the three research questions discussed above, it can be stated that this study was successful in developing an assessment scale useful in the caring process.

The scale is an aid for health professionals who want to assess patients' needs and the degree of professional assistance necessary to meet these needs. With this knowledge, professional care providers can develop a plan of care to accomplish care-to-standard in determining diagnoses, objectives and interventions, with the aim to help the patient reach a state of increasing independency in performing self-care.

Recommendations

Recommendations for further lines of enquiry include studies on clinical significance, especially for the mentally handicapped populations. Although the CDS has been developed and psychometrically tested for both demented and mentally handicapped patients, the latter group was underexposed in the second part of the project.

Besides, further studies are needed at different locations among other specific patient groups to assess if the CDS can be used successfully with elderly patients in care facilities or care situations other than nursing homes and institutions for the mentally handicapped. For example, patient groups living in homes for the elderly, staying on elderly wards in general hospitals, and/or receiving intensive home care. Although it is acceptable to believe that care dependency can be assessed by the CDS, this measurement instrument has only proven to be reliable and valid for use in two specific patient groups. Therefore, the importance of such studies would be that they deliver the qualitative and quantitative evidence that the item features, item descriptions and item criteria are fundamental in assessing care dependency, independent of place (where the patient is living: outside or inside an institution) and time (severity or rate/speed of progression of the disease).

Furthermore, it is also of importance to study changes and differences with regard to care dependency, especially, to examine which factors predict patient's care dependency over time. Although it cannot be denied beforehand that the so-called social factors 'communication' and 'contact with others' are strongly related with further loss of independency, this relation evokes three types of questions. First, it is theoretically possible that other factors than 'communication' and 'contact with others' will be found in follow-up research.

Second, a limited number of patients' characteristics for analysis were investigated in the study undertaken; therefore, it is theoretically conceivable that other factors also predict care dependency, for example, income, lifestyle, employment. Third, it can be questioned in what way health professionals, significant others and/or institutions play a role as to the cause of care dependency and how they influence this dependency. The most obvious thing to think of are the facilities offered by the institute, for example, the possibility of arranging the presence and/or participation of significant others in the caring process, the intensity of the contacts with nurses or nurse assistants, the influence of the nurse system (task or patient oriented). Besides, for future research it is also advisable to select fresh cases in the research sample. In the source study which was undertaken, patients had already been admitted tothe nursing home. The advantage of fresh cases is that they offer a better opportunity to follow the course of care dependency over time from the first moment of admission. Moreover, in order to obtain a more detailed picture of cultural similarities and differences with regard to the care dependency concept, more international research is needed. Although there is evidence that the CDS can be used for international comparison and can contribute to the development of international standards for need assessment of patients with dementia, further international research has to be done.

A final issue that can be mentioned for future research concerns the investigation of the effect of the CDS assessment on the outcome of the multi-disciplinary decision-making process. The CDS is developed as an assessment tool, but more insight is needed into the means by which the CDS item-assessment can contribute to establishing multi-disciplinary diagnosis, objectives and interventions in terms of CDS features. Besides, more insight is needed into the effect of these outcomes on the treatment programme to stabilize or to decrease care dependency. Not only the effect of health professionals' contributions to the treatment has to be investigated, also special attention must be given to the place and the role of the patient in the treatment programme.

As already stated, the decision to speak in future of the Care Dependency Scale requires an investigation into the question how health professionals, other than nurses, can use the scale in their assessments of the patient's need status.

The outcomes of such studies can add to a better knowledge and understanding in health professionals of the consequences of care dependency for patients. Besides, they may be helpful in developing more accurate and better treatment programmes for helping or teaching patients to decrease or cope with their care dependency status.

11 Summary in Dutch

Ate Dijkstra

Samenvatting

Dit proefschrift beschrijft een onderzoek naar het toepassen van het begrip zorgafhankelijkheid[5] binnen de zorg aan psychogeriatrische en, ten dele, verstandelijk gehandicapte patiënten. Dit project wordt uitgevoerd in de context van het onderzoeksprogramma 'Disorder, Disability and Quality of Life' van het Noordelijk Centrum voor Gezondheidsvraagstukken (NCG) van de Rijksuniversiteit Groningen. In het genoemde programma wordt met name de rol van functionele, sociale en psychologische factoren bestudeerd op het beloop en het herstel van het dagelijks functioneren en de kwaliteit van leven bij chronische zieken. Tevens is de ontwikkeling van betrouwbare en valide meetinstrumenten kenmerkend voor het NCG onderzoek.
In hoofdstuk één wordt het onderzoek ingeleid met een algemene beschrijving van de beweegredenen en het noemen van de onderzoeksvragen. Kenmerkend voor het leven in (psychogeriatrische) verpleeghuizen en instellingen voor verstandelijk gehandicapten is de grote mate van afhankelijkheid, welke de opgenomen patiënt[6] kent ten opzicht van degenen die hen verplegen en verzorgen. In reactie op deze constatering is, zowel van overheidswege als vanuit de koepelorganisaties voor de gehandicaptenzorg (NVGz) en de verpleeghuiszorg (NVVz), beleid geïnitieerd met als doel patiënten zo lang mogelijk zelfstandig en zo gering mogelijk afhankelijk van anderen te laten zijn en worden.

[5] Zorgafhankelijkheid is de Nederlandse vertaling van 'Care Dependency', de titel en het thema van deze studie .

[6] Ter voorkoming van uitgebreide naamgeving is gekozen voor het begrip patiënt. Onder dit begrip dient begrepen te worden de in de zorgsectoren van het verpleeghuis en de verstandelijk gehandicaptenzorg gebezigde benaming van bewoner, cliënt of pupil .

Instellingen, waar langdurige verpleging en verzorging (care) wordt gegeven aan hulpbehoevende ouderen en aan mensen met een verstandelijke beperking, dienen zich dan ook in hun zorgconcept te richten op vermindering van de beperkingen van de ziekte, de verbetering van de kwaliteit van leven en het behoud van maatschappelijke participatie en zelfstandigheid (Ministerie VWS, 1995). Deze uitgangspunten vragen om een andere benadering van de huidige zorgverlening. Er dient niet meer gedacht te worden in termen van aanbod, maar in termen van zorgvragen door de patiënt. Het 'zorg-op-maat' concept is daarvoor bij uitstek geschikt. 'Zorg op maat' geldt als een belangrijke en in de Nederlandse zorgverlening breed omschreven visie op zorgverlening. Deze visie kenmerkt zich in de eerste plaats doordat de hulpvraag of de zorgbehoefte centraal wordt gesteld. Deze wordt breed onderzocht, onafhankelijk van het bestaande zorgaanbod. Door zorgvuldige inventarisatie van de behoeften wordt nagegaan hoe een specifiek individu met die specifieke handicap het beste geholpen kan worden. Pas na de inventarisatie wordt gekeken welke zorgvoorziening het best aansluit bij de geconstateerde behoeften. Soms blijkt dat van verschillende aanbodfuncties gebruik gemaakt moet worden, of dat een nieuwe vorm van zorgverlening het meest adequaat zou zijn. De centrale gedachte van de 'zorg op maat' visie is dus dat de (individuele) behoefte én institutionele (on)mogelijkheden bepalen welke zorg gegeven dient te worden (Vreeke *et al.*, 1993).
Aangespoord door het zorg-op-maat concept, zijn door genoemde zorgsectoren initiatieven ontplooid om binnen het domein van verpleging en verzorging de kwaliteit van zorg te definiëren in een hernieuwd zorgconcept. In het zorgconcept van het verpleeghuis, de harde kwaliteitskern van het verpleeghuisprodukt, ligt zorg-op-maat voor de patiënt besloten in de ruimte voor het maken van eigen keuzen en het streven de eigen zelfstandigheid zo groot mogelijk te houden door deze de geëigende plaats en rol te geven in het individuele zorgproces (NVVz, 1992). Het zorgconcept van de verstandelijke gehandicaptenzorg gaat eveneens uit van het principe zorg-op-maat. De kern daarvan is een sterke oriëntatie op het individu en zijn hulpvraag, welke er op gericht is om mensen met een verstandelijke handicap in staat te stellen zo gewoon en zelfstandig mogelijk te leven (NVGz & Fiad-Wdt, 1992; NVGz, 1994).

In een reactie op het werk van Goffman (1961), Szasz (1961) en Freidson (1970) zijn door beroepsbeoefenaars uit verpleeghuizen en instellingen voor verstandelijk gehandicapten vele initiatieven ontwikkeld gericht op handhaving, bewaking en verbetering van de kwaliteit van zorg (NVGz, 1993; NVVz, 1993). De laatste jaren is het kwaliteitsdenken in deze zorgsectoren mede gestimuleerd door de wet op de kwaliteit van door instellingen verleende zorg. In deze kwaliteitswet zorginstellingen stelt de wetgever eisen omtrent de aanwezigheid en het functioneren van een intern kwaliteitsbeleid (Ministerie WVC, 1991). In de memorie van toelichting op de kwaliteitswet zorginstellingen wordt de kwaliteit van de zorg gezien als de wijze waarop de instelling het zorgproces heeft vormgegeven (Ministerie WVC, 1994).

In het vormgeven van het zorgproces in deze sectoren kan niet voorbij gegaan worden aan het specifieke zorgkarakter van beide instellingen. In tegenstelling tot de niet langdurige zorgsectoren, waar behandelen en genezen centraal staat (cure), ligt het accent van de zorg binnen de verpleeghuizen en de verstandelijk gehandicaptenzorg op de verzorging en verpleging van de patiënt (care). Institutionele zorg is altijd het traditionele domein van de verpleegkundige en verzorgende geweest, waardoor deze beroepsgroep in belangrijke mate bepaalt hoe de (kwaliteit van) zorg vorm wordt gegeven (Buist, 1996). Kwaliteit van zorg is voor verplegenden en verzorgenden synoniem aan 'goede zorg' en daarvan is naar hun mening sprake, wanneer ze de patiënt als uitgangspunt nemen van hun handelen en wanneer de zorg is afgestemd op diens wensen en behoeften (Boeije, 1994). In wat Henderson (1985, 1987) noemt de enige beschikbare zorgverlening op basis van 24-uur-per-dag en zeven-dagen-per-week, is het wezen van het verpleegkundig handelen het aanvoelen van wat patiënten wensen en nodig hebben om hun dagelijkse activiteiten uit te voeren, hun lichamelijk en psychosociaal functioneren inbegrepen.

Voor wat betreft de verpleging en de verzorging heeft dit geleid tot het interdisciplinair samenwerken en het vastleggen van behandelafspraken in zorgdossiers. Ook is de werkwijze meer systematisch en methodisch doordacht, wat binnen de verpleegkundige zorg tot uiting is gebracht in de invoering van het verpleegkundig proces in samenhang met (individuele) zorgplannen (Dijkstra, 1990; Barnhard & Meerveld, 1992). Juist het verpleegkundig proces biedt de mogelijkheid om maatwerk tot stand te brengen.

In het cyclisch doorlopen van de stappen van het verpleegkundig proces kan de zorgvraag en de bijdrage van zowel de patiënt als de verpleegkundige daaraan bepaald worden.
Tegen de achtergrond van bovengenoemde beweegredenen, is het wenselijk dat verplegenden en verzorgende eerst over gedetailleerde kennis beschikken over de mate waarin een patiënt afhankelijk is, voordat bepaald wordt welke zorg gegeven dient te worden om het doel van 'maximale onafhankelijkheid' te bereiken.
Deze constatering heeft geleid tot het schrijven van dit proefschrift, waarin een nadere uitwerking gegeven wordt van de, binnen deze studie gestelde, onderzoeksvragen naar (1) de betekenis van het begrip zorgafhankelijkheid, naar (2) het ontwikkelen van een instrument om de zorgafhankelijkheid van de patiënt te beoordelen en het bepalen van de psychometrische eigenschappen van het instrument en, tenslotte, naar (3) het onderzoeken van de relevantie van het instrument voor de praktijk. Van het onderzoek wordt verslag gedaan in een achttal hoofdstukken, welke in de vorm van tijdschriftartikelen zijn geschreven.
Na de inleiding van hoofdstuk één gaat hoofdstuk twee uitgebreid in op het begrip zorgafhankelijkheid. Gebaseerd op literatuuronderzoek wordt zowel de betekenis van het begrip afhankelijkheid als wel de relatie tussen afhankelijkheid en verpleegkundige zorg besproken. Tevens wordt het begrip zorgafhankelijkheid in een theoretisch kader geplaatst en van een theoretische definitie voorzien.
Zorgafhankelijkheid wordt omschreven als een proces waarin de professionele hulpverlener ondersteuning aanbiedt aan een patiënt, wiens zelfzorgvermogen is afgenomen en wiens zorgvragen hem/haar in een bepaalde mate afhankelijk maakt, met het doel te werken aan de onafhankelijkheid van de patiënt om in de eigen zelfzorg te voorzien. Om aan het begrip zorgafhankelijkheid nadere eigenschappen toe te kennen wordt het geplaatst binnen het model van Virginia Henderson. Henderson beschrijft veertien menselijke behoeften welke vertaald zijn in veertien kenmerken van zorgafhankelijkheid. In hoofdstuk drie wordt vervolgens de ontwikkeling en de inhoudsvaliditeit van het beoordelingsinstrument zorgafhankelijkheid beschreven. Door middel van een Delphi onderzoek is met behulp van experts uit de praktijk bepaald of de veertien zorgafhankelijkheidsitems, itemomschrijvingen en itemcriteria op voldoende wijze de inhoud van het begrip zorgafhankelijkheid weergeven.

Hendersons veertien menselijke basisbehoeften blijken hiervoor bruikbaar, waarmee een basis gecreëerd is voor het uiteindelijke model van het beoordelingsinstrument. In het algemeen komt het commentaar van de panelleden overeen met wat in de literatuur geschreven wordt over Hendersons oorspronkelijke lijst van basisbehoeften. De nieuw gegenereerde lijst bestaat uit de volgende veertien zorgafhankelijkheidsitems: eten en drinken, incontinentie, lichaamshouding, mobiliteit, dag en nachtritme, aan- en uitkleden, lichaamstemperatuur, hygiëne, vermijden van gevaar, contact met anderen, waarde- en normbesef, dagelijkse activiteiten binnen de woongroep, recreatieve activiteiten buiten de woongroep en leervermogen. Slecht één item, communicatie, is toegevoegd aan Hendersons oorspronkelijke lijst van veertien basisbehoeften. Geconcludeerd is dat de vijftien items een tekstueel heldere en begrijpelijke lijst van zorgafhankelijkheidskenmerken vertegenwoordigen. Verder is opmerkelijk dat de panelleden afkomstig uit zowel de psychogeriatrische verpleeghuizen als de verstandelijk gehandicaptenzorg onderling niet fundamenteel van mening verschillen. Zo is voor beide groepen patiënten een identieke structuur van items, de item-omschrijvingen en de item-criteria ontwikkeld. Naast deze klinische versies van het instrument, voor gebruik ten behoeve van het routinematige beoordelen en de diagnostiek van patiënten in het kader van het (verpleegkundig) zorgproces, is een onderzoeksversie ontwikkeld. Deze versie wordt voor wetenschappelijk onderzoek gebruikt of waar met een globale beoordeling van zorg afhankelijk kan worden volstaan. De klinische en de onderzoekversie zijn identiek ten aanzien van de vijftien zorgafhankelijkheids-items en de daarbij bijbehorende item-omschrijvingen. Beide versies verschillen ten aanzien van het beoordelen van de zorgafhankelijkheid. Zo wordt de zorgafhankelijkheid met de onderzoeksversie beoordeeld op een vijf-punts-Likertschaal. Daarentegen vraagt de klinische versie de zorgafhankelijkheid te beoordelen door een keuze te maken uit een vijftal geschreven criteria. Voor beide versies geldt dat een somscore berekend kan worden door het optellen van de itemscore. Theoretisch gezien loopt de somscore uiteen van '15' tot '75', daarbij geldt hoe hoger de score, hoe minder de zorgafhankelijkheid.
Daar er geen norm gehanteerd kon worden om patiënten in te delen naar de mate van zorgafhankelijkheid, is aan beide versies van het instrument een zestiende item toegevoegd.

Op een vijf-punts-Likertschaal wordt het oordeel van de invuller vastgelegd over de mate van zorgafhankelijkheid, uiteenlopend van '1' voor volledig zorg afhankelijk tot '5' voor vrijwel zelfstandig. In de vervolg onderzoeken is de beoordeling van het zestiende item gebruikt als 'gouden standaard' van de mate van zorgafhankelijkheid Voortbouwend op de bevindingen uit de voorafgaande hoofdstukken, wordt in de drie volgende hoofdstukken het onderzoek naar de psychometrische eigenschappen van de klinische versie van het zorgafhankelijkheidsinstrument (CDS)[7] beschreven ten behoeve van zowel het gebruik in psychogeriatrische verpleeghuizen en in de verstandelijke gehandicaptenzorg.
In hoofdstuk vier wordt de betrouwbaarheid en de bruikbaarheid van het instrument bestudeerd. Drie aspecten van betrouwbaarheid zijn onderzocht: de interne consistentie, de interbeoordelaars-overeenstemming en de intrabeoordelaarsovereenstemming. In termen van interne consistentie zijn hoge Cronbachs alpha waarden gevonden, zodat de CDS in de klinische praktijk zowel voor het vergelijken van groepen als op individueel niveau bruikbaar blijkt te zijn. De interbeoordelaarsovereenstemming is bepaald door de scores op de vijftien items van de CDS van twee onafhankelijke beoordelaars, welke op één meetmoment zijn gescoord, te vergelijken. De intrabeoordelaarsovereenstemming is bepaald door de overeenkomst in scores van één beoordelaar met een tussenperiode van twee weken te vergelijken. De uitkomsten van beide betrouwbaarheidsonderzoeken geven voor de meeste CDS items redelijke tot goede Kappa waarden aan, slechts een enkel kenmerk scoort matig. Voor de bruikbaarheid van de schaal is met name gekeken naar de invultijd en duidelijkheid. In gemiddeld acht minuten kon de schaal ingevuld worden. De invulinstructie is door 88% van de ondervraagden als goed beoordeeld.
In hoofdstuk vijf worden de resultaten beschreven van een studie om de begripsvaliditeit van de CDS vast te stellen, daarbij is gebruik gemaakt van twee onderzoektechnieken: factoranalyse en Mokken schaalanalyse. Volgens het principale componentenmodel is een factoranalyse uitgevoerd om inzicht te krijgen in de onderlinge samenhang van de vijftien zorgafhankelijkheidsitems.

[7] Het zorgafhankelijkheidsinstrument zal in het vervolg van dit hoofdstuk aangeduid worden met de Engels-talige naam: Care Dependency Scale, afgekort als CDS.

De gevonden resultaten wijzen erop dat de vijftien items een ééndimensionele structuur van zorgafhankelijkheid meten.
Alle items laden positief en hoog op de eerste factor, terwijl de eigenwaarde van deze factor meer dan een tienvoud is van de tweede factor. Met behulp van de Mokken schaalanalyse techniek is vervolgens nagegaan in hoeverre er sprake is van een hiërarchische structuur tussen de 15 items. De gevonden H-coëfficiënten op zowel schaal- als itemniveau duiden op een zeer sterke schaal met een sterke onderlinge, hiërarchische samenhang tussen de items. Het instrument mag zo worden geïnterpreteerd dat een patiënt die een bepaald kenmerk in de schaal vertoont, met grote kans ook de kenmerken heeft die eerder in de schaal voorkomen. Bovenstaande geeft aanwijzingen dat zowel de klinische als de onderzoeksversie van de CDS valide zijn. De resultaten van de toegepaste analyse technieken laten voor beide versies van het instrument overeenkomstige resultaten zien. De gevonden psychometrische eigenschappen bevestigen de begripsvaliditeit van de CDS en rechtvaardigen het om te spreken van een schaal.
In hoofdstuk zes wordt verslag gedaan van het onderzoek naar de soortgenoten validiteit door met name de convergente validiteit en de discriminante validiteit vast te stellen van de CDS. De convergente validiteit is onderzocht door te kijken naar de relatie van de schaal met de Beoordelingsschaal voor Oudere Patiënten (BOP) of de Sociale Redzaamheidsschaal voor Zwakzinnigen (SRZ). De discriminante validiteit is onderzocht door het bestuderen van de relatie tussen de Care Dependency Scale en de Gedragsobservatieschaal voor de Intramurale Psychogeriatrie (GIP). Resultaten tonen een sterke correlatie aan tussen de CDS en vier van de subschalen van de BOP en tussen de CDS en de SRZ, wat een bevestiging geeft van de convergente validiteit. De correlaties tussen de CDS en tien van de veertien subschalen van de GIP zijn zwak. Uit onderzoek naar het discriminerend vermogen blijkt de CDS een geschikt instrument te zijn om de dementie patiënten in te delen volgens het Nieuw Toutenburgse classificatiesysteem naar begeleidings-, verzorgings- of verplegingsbehoeftig niveau.
In hoofdstuk zeven wordt verslag gedaan van de psychometrische evaluatie van de CDS in een viertal landen. Ten grondslag aan deze studie liggen de data van dementie patiënten uit Nederland, Canada, Italië en Noorwegen.

Deze studie heeft ten doel antwoord te geven op de vraag of de CDS de zorgafhankelijkheid van dementiepatiënten in de verschillende landen betrouwbaar en valide meet. De betrouwbaarheidsanalyses laten ten aanzien van de interne consistentie van de CDS hoge Cronbachs alpha waarden zien.
De resultaten voor de interbeoordelaars- en intrabeoordelaarsovereenstemming zijn aanvaardbaar voor zowel de afzonderlijke landen als de landen als geheel. In al de vier landen is met behulp van factoranalyse (Principale Componenten Analyse) eenzelfde één-factorstructuur gevonden. Het resultaat van de Mokken-schaalanalyse geeft voor alle landen een zeer sterke hiërarchische ordening aan. Ook de voor elk land gevonden H-coëfficiënt van de schaal zijn dusdanig dat van een zeer sterke hiërarchische schaal gesproken mag worden. De vijftien CDS items blijken betrekking te hebben op fundamentele menselijke basisbehoeften die in elke zorgrelatie tussen patiënt en zorgverleners voorkomen, onafhankelijk van culturele achtergronden. Hoewel verder onderzoek nodig is, laten de uitkomsten als geheel zien dat de CDS waardevol is om de zorgafhankelijkheid van dementie patiënten uit verschillende landen te vergelijken en dat de CDS een bijdrage kan leveren aan het ontwikkelen van een internationale standaard om de zorgafhankelijkheid van dementie patiënten te beoordelen.
In de hoofdstukken acht en negen worden twee toepassingen van de Care Dependency Scale in de psychogeriatrische praktijk beschreven. Een psychogeriatrische verpleeghuispopulatie is gedurende een periode van twee jaar gevolgd en gedurende deze periode twee keer beoordeeld.
In hoofdstuk acht is de relatie onderzocht tussen enerzijds de ernst van de zorgafhankelijkheid en anderzijds de doodsoorzaak, de overlevingskans en de co-morbiditeit van dementie patiënten. De ernst van de zorgafhankelijkheid is vastgesteld van de hand van de mediaan op de CDS. Op deze wijze zijn twee onderzoeksgroepen samengesteld: één welke ernstig zorgafhankelijk genoemd kan worden en één waarvan de zorgafhankelijkheid als mild getypeerd kan worden. Bij aanvang van het onderzoek is een statistisch significant verschil tussen beide groepen vastgesteld in ziekteduur, opnameduur en op al de vijftien kenmerken van zorgafhankelijkheid. Ten aanzien van leeftijd, de aanvang van de ziekte van Alzheimer en de aanwezigheid van co-morbiditeit tussen beide groepen is geen duidelijk verschil aangetoond.

Van de overleden patiënten in beide groepen worden als belangrijkste doodsoorzaken aandoeningen genoemd die gerelateerd zijn aan cachexie en/of dehydratie. Het onderzoek laat verder zien dat de overlevingskans van Alzheimer patiënten verschilt naar de ernst van de zorgafhankelijkheid.
Vergeleken met de groep met een milde zorgafhankelijkheid is bij patiënten met een ernstige vorm van zorgafhankelijkheid een duidelijk verschil in sterfte van 20% aangetroffen. De uitkomsten van het onderzoek naar indicatoren om de overlevingskans te voorspellen zijn te verdelen in de demografische factor 'burgerlijke staat', de sociaal-economische factor 'opleiding', de medische factor 'hartziekten' en de vier zorgafhankelijkheidskenmerken: lichaamshouding, dag/nacht ritme, communicatie en contact met anderen. Onduidelijk is hoe representatief de onderzochte groep patiënten is voor de populatie patiënten met dementie van het Alzheimer-type.
In hoofdstuk negen worden predictoren beschreven betreffende veranderingen en verschillen in de zorgafhankelijkheid van patiënten tussen T1 en T2. Als mogelijke voorspellers van zorgafhankelijkheid zijn tevens sociaal-demografische en klinische factoren aan het onderzoeksmodel toegevoegd. Uitkomsten laten na twee jaar een toename zien op bijna alle kenmerken van zorgafhankelijkheid. Uit verdere analyse is naar voren gekomen dat, ondanks significante correlaties met de verschilscore van zorgafhankelijkheid (T2 minus T1), de gekozen sociaal-demografische en klinische factoren geen significante voorspellers zijn van toekomstige zorgafhankelijkheid. Daarentegen blijken het verlies van sociale relaties, het verlies van communicatieve vaardigheden en de mate van zorgafhankelijkheid op het moment van de aanvang van de studie (T1) sterke voorspellers te zijn van de toename van zorgafhankelijkheid. Uitkomsten van dit onderzoek geven aan dat de CDS gevoelig is voor de toename van zorgafhankelijkheid in de tijd en dat de schaal bruikbaar is in het aantonen van zorgafhankelijkheid.
Tot slot worden in hoofdstuk tien de hoofdstukken van dit onderzoek samengevat en volgt over de belangrijkste resultaten een discussie. De volgende vragen worden besproken: moet 'zorgafhankelijkheid' als een uni- of multidisciplinair concept opgevat worden; in hoeverre heeft deze studie een betrouwbaar en valide instrument opgeleverd; op welke wijze kan het instrument gebruikt worden in instellingen.

Ter onderbouwing van de keuze om het concept 'zorgafhankelijkheid' in een multidisciplinaire context te plaatsen wordt verwezen naar de huidige praktijk waarin meerdere disciplines bijdragen aan de beoordeling en de behandeling van de gevolgen van zorgafhankelijkheid voor de patiënt. De uitkomsten van een aantal onderzoeken naar de psychometrische eigenschappen van de CDS ondersteunen in voldoende mate de betrouwbaarheid en validiteit van het instrument.

De tweede vraag kan dan ook positief beantwoord worden. De verwachting kan daarom uitgesproken worden dat instellingen in het verder ontwikkelen van hun zorgbeleid de Care Dependency Scale gaan gebruiken om de zorgbehoeften en de zorgvragen van patiënten te beoordelen en te categoriseren. Deze beoordeling kan plaatsvinden na opname, met een terugkerende regelmaat in de tijd, of wanneer een opmerkelijke verandering optreedt in de zorgafhankelijkheid van de patiënt.

Ook wordt stilgestaan bij de bijdrage van Hendersons human needs theorie aan het ontwerp van het instrument en de theorievorming betreffende zorgafhankelijkheid. Aandacht wordt geschonken aan hoe de invuller van het instrument de zorgafhankelijkheid van de patiënt dient te beoordelen. Niet de actuele zorgbehoefte dient beoordeeld te worden, maar de potentiële mogelijkheden waartoe de patiënt in staat is. In het licht van beleidsaanbevelingen wordt de bijdrage van het instrument aan het ontwikkelen van een effectief zorgbeleid binnen instellingen besproken. Met name daar waar instellingen het 'zorg-op-maat' concept willen gaan invoeren; van een probleemgeoriënteerd naar een ontwikkelingsgeoriënteerd zorgmodel willen gaan; instrumenten ontberen of problemen kennen ten aanzien van een slechte categorisering van zorgbehoeften; onduidelijkheid signaleren in de manier waarop de beoordeling van zorgbehoeften bijdraagt aan de totstandkoming van het multidisciplinair zorgbeleid, zou de Care Dependency Scale een effectief antwoord zijn bij het ontwikkelen van nieuw beleid.

Als laatste worden een aantal aanbevelingen genoemd voor verder onderzoek. In dit verband wordt gewezen op het onderzoeken van de bruikbaarheid van het instrument in zorgssituaties anders dan het verpleeghuis en de verstandelijke gehandicaptenzorg. Nader onderzoek is wenselijk naar mogelijk andere dan de gevonden factoren die het risico op en het verloop van zorgafhankelijkheid voorspellen.

Ook nader internationaal onderzoek is wenselijk om een meer gedetailleerd beeld te krijgen van culturele verschillen en overeenkomsten in zorgafhankelijkheid. Verder dient het effect van de CDS beoordeling op de vervolgfasen binnen het zorgproces en de bruikbaarheid van het instrument voor andere disciplines in het vaststellen van zorgafhankelijkheid onderzocht te worden.

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Appendix: Dutch, Italian, Norwegian and US-English versions of the Care Dependency Scale (CDS), used in this study

DUTCH version of the CDS for use in research, used in this study

1 ETEN EN DRINKEN	De mate waarin de bewoner in staat is zelfstandig te voldoen aan de behoefte aan eten en drinken
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

2 INCONTINENTIE	De mate waarin de bewoner het vermogen heeft de uitscheiding van urine en faeces willekeurig te beheersen
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

3 LICHAAMSHOUDING	De mate waarin de bewoner in staat is bij een bepaalde activiteit een juiste houding aan te nemen
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

4 MOBILITEIT	De mate waarin de bewoner fysiek in staat is zich zelfstandig kan voortbewegen
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

5 DAG-NACHTRITME	De aard van het slaap-waakpatroon (bio-ritme) van de bewoner
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

6 AAN- EN UITKLEDEN	De mate waarin de bewoner beschikt over vaardigheden om zich zelfstandig aan- en uit te kleden
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

7 LICHAAMS-TEMPERATUUR	De mate waarin de bewoner in staat is zelfstandig de lichaamstemperatuur te beschermen tegen externe invloeden
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

8 HYGIËNE	De mate waarin de bewoner in staat is zelfstandig zorg te dragen voor zijn/haar lichaamsverzorging
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

9 VERMIJDEN VAN GEVAAR	De mate waarin de bewoner in staat is zelfstandig voor zijn/haar eigen veiligheid te zorgen
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

10 COMMUNICATIE	De mate waarin de bewoner in staat is te communiceren
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

11 CONTACT MET ANDEREN	De mate waarin de bewoner in staat is tot het aangaan, onderhouden en afbreken van sociaal contact
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

12 WAARDE- EN NORMBESEF	De mate waarin de bewoner in staat is zelfstandig leefregels te hanteren
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

13 DAGELIJKSE ACTIVITEITEN BINNEN DE WOONGROEP	De mate waarin de bewoner in staat is zelfstandig invulling te geven aan de dagelijkse bezigheden binnen de woongroep
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

14 RECREATIEVE ACTIVITEITEN BUITEN DE WOONGROEP	De mate waarin de bewoner in staat is zelfstandig deel te nemen aan activiteiten buiten de leefgroep
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

15 LEERVERMOGEN	De mate waarin de bewoner in staat is om zelfstandig kennis en/of vaardigheden aan te leren dan wel het geleerde in stand te houden
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

16 SAMENVATTING	Tenslotte, geef aan welke omschrijving van zorgafhankelijkheid van toepassing is op de bewoner als geheel
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

DUTCH version of the CDS for use in nursing home practice, used in this study

1 ETEN EN DRINKEN	De mate waarin de bewoner in staat is zelfstandig te voldoen aan de behoefte aan eten en drinken
1	Bewoner is niet in staat eten en drinken zelfstandig tot zich te nemen
2	Bewoner is niet zelfstandig in staat tot het opscheppen en klaarmaken van eten en drinken; is in staat zelfstandig eten en drinken naar de mond te brengen
3	Bewoner is met toezicht in staat tot het zelfstandig opscheppen, klaarmaken en naar de mond brengen van eten en drinken; kan hoeveelheid moeilijk bepalen
4	Bewoner is in staat met beperkt toezicht zelfstandig te eten en te drinken
5	Bewoner is in staat zelfstandig te voldoen aan de bereiding en de behoefte aan eten en drinken

2 INCONTINENTIE	De mate waarin de bewoner het vermogen heeft de uitscheiding van urine en faeces willekeurig te beheersen
1	Bewoner is niet zelfstandig in staat de uitscheiding van urine en/of faeces op te houden; is volledig incontinent
2	Bewoner is niet zelfstandig in staat de uitscheiding van urine en/of faeces te regelen; zonder hulp en/of hulpmiddelen is spontane uitscheiding niet mogelijk
3	Bewoner is in staat, mits volgens vaste patronen gestuurd, vrijwel continent te zijn
4	Bewoner is in staat de uitscheiding vrijwel zelfstandig te regelen, doet dit soms op plaatsen die daar niet voor bestemd zijn
5	Bewoner is in staat de uitscheiding te regelen

3 LICHAAMSHOUDING	De mate waarin de bewoner in staat is bij een bepaalde activiteit een juiste houding aan te nemen
1	Bewoner is niet zelfstandig in staat zelfstandig van lichaamshouding te veranderen
2	Bewoner is beperkt in staat zelfstandig een gewenste lichaamshouding aan te nemen bij activiteiten
3	Bewoner is in staat een juiste lichaamshouding aan te nemen bij activiteiten, maar past dit onvoldoende zelfstandig toe
4	Bewoner heeft weinig beperkingen in het zelfstandig aannemen van de juiste lichaamshouding
5	Bewoner heeft geen beperkingen in het zelfstandig aannemen van de juiste lichaamshouding

4 MOBILITEIT	De mate waarin de bewoner fysiek in staat is zich zelfstandig kan voortbewegen
1	Bewoner is immobiel en niet in staat tot het zelfstandig gebruik van hulpmiddelen
2	Bewoner is beperkt in staat zich zelfstandig voort te bewegen; maakt veelal gebruik van hulpmiddelen
3	Bewoner is redelijk mobiel, eventueel met gebruik van hulpmiddelen
4	Bewoner is in staat zich vrijwel zelfstandig voort te bewegen
5	Bewoner is volledig in staat zich zelfstandig voort te bewegen

5 DAG-NACHTRITME	De aard van het slaap-waakpatroon (bio-ritme) van de bewoner
1	Bewoner is niet gevoelig voor het dag- en nachtritme
2	Bewoner is beperkt gevoelig voor het dag- en nachtritme
3	Bewoner is gevoelig voor het dag- en nachtritme, heeft veel begeleiding nodig
4	Bewoner is gevoelig voor het dag- en nachtritme, heeft weinig begeleiding nodig
5	Bewoner heeft een normaal dag- en nachtritme, zorgt zelfstandig voor voldoende rust

6 AAN- EN UITKLEDEN	De mate waarin de bewoner beschikt over vaardigheden om zich zelfstandig aan- en uit te kleden
1	Bewoner is niet in staat zich zelfstandig aan- en uit te kleden
2	Bewoner is beperkt in staat zich zelfstandig aan- en uit te kleden, is niet in staat de logische volgorde van handelingen uit te voeren
3	Bewoner is deels in staat zich zelfstandig aan- en uit te kleden, heeft toezicht en begeleiding nodig
4	Bewoner is in staat zich vrijwel zelfstandig aan- en uit te kleden, heeft begeleiding nodig bij fijn-motorische vaardigheden
5	Bewoner is in staat zich zelfstandig aan- en uit te kleden, beschikt over fijnmotorische vaardigheden

7 LICHAAMS-TEMPERATUUR	De mate waarin de bewoner in staat is zelfstandig de lichaamstemperatuur te beschermen tegen externe invloeden
1	Bewoner is niet in staat zelfstandig gevoelens van koude en warmte aan te geven
2	Bewoner is beperkt in staat zelfstandig gevoelens van koude en warmte aan te geven; is niet in staat zelfstandig gepaste maatregelen daartegen te nemen
3	Bewoner is in staat zelfstandig gevoelens van koude en warmte aan te geven; is beperkt in staat zelfstandig gepaste maatregelen daartegen te nemen
4	Bewoner is in staat zelfstandig gevoelens van koude en warmte aan tegeven; is in hoge mate in staat zelfstandig gepaste maatregelen daartegen te nemen
5	Bewoner is in staat volledig zelfstandig de lichaamstemperatuur tegen externe invloeden te beschermen

8 HYGIËNE	De mate waarin de bewoner in staat is zelfstandig zorg te dragen voor zijn/haar lichaamsverzorging
1	Bewoner is niet in staat zelfstandig een bijdrage te leveren aan de lichaamsverzorging, zoals wassen, tandenpoetsen, haren kammen, etc.
2	Bewoner is beperkt in staat zelfstandig een bijdrage te leveren aan de lichaamsverzorging; doet dit niet uit zichzelf
3	Bewoner is in staat zelfstandig een aantal handelingen rondom de lichaamsverzorging uit te voeren; toezicht en begeleiding is nodig
4	Bewoner is in staat zelfstandig de meeste handelingen rondom de lichaamsverzorging uit te voeren; enig toezicht en begeleiding is nodig
5	Bewoner is in staat volledig zelfstandig zorg te dragen voor de eigen lichaamsverzorging

9 VERMIJDEN VAN GEVAAR	De mate waarin de bewoner in staat is zelfstandig voor zijn/haar eigen veiligheid te zorgen
1	Bewoner is niet in staat zelfstandig gevaar te onderkennen en te vermijden
2	Bewoner is beperkt in staat zelfstandig gevaren in de omgeving te onderkennen en te vermijden, dan wel zich te beschermen tegen eigen of andermans agressie
3	Bewoner is in staat deels zelfstandig een aantal risicovolle situaties in de omgeving te onderkennen en te vermijden; heeft hulp nodig om zich te beschermen tegen agressie van anderen
4	Bewoner is in staat vrijwel zelfstandig gevaar in de omgeving te onderkennen en te vermijden, dan wel zich te beschermen tegen agressie van anderen
5	Bewoner is in staat zelfstandig zorg te dragen voor de eigen veiligheid

10 COMMUNICATIE	De mate waarin de bewoner in staat is te communiceren
1	Bewoner is niet in staat zich door middel van woorden te uiten; door lichaamstaal kan de bewoner zijn belevingen aan bekenden uiten
2	Bewoner is beperkt in staat zich door woord en/of gebaar te uiten; maakt gebruik van klanken om zijn beleving te uiten; begrijpt door intonaties de boodschap die anderen willen overbrengen
3	Bewoner is in staat middels woordjes en/of specifieke gebaren eigen bedoelingen te uiten; begrijpt korte eenvoudige woorden van anderen
4	Bewoner is in staat zich door woord- en zingebruik en/of gebaren te uiten; begrijpt eenvoudige taal en/of gebaren van anderen
5	Bewoner is in staat zich door taal en/of gebaar te uiten; is in staat belevingen met anderen te delen

11 CONTACT MET ANDEREN	De mate waarin de bewoner in staat is tot het aangaan, onderhouden en afbreken van sociaal contact
1	Bewoner is niet in staat zelfstandig contacten met anderen te leggen; reageert positief op prettige belevingen en/of negatief op onprettige belevingen
2	Bewoner is beperkt in staat zelfstandig contacten met anderen te leggen; reageert op voor de bewoner belangrijke personen
3	Bewoner is in staat tot het zelfstandig onderhouden van een beperkt aantal contacten met de bewoner belangrijke personen
4	Bewoner is vrijwel zelfstandig in het aangaan, onderhouden en afbreken van contacten; enigszins inhoud te geven aan deze contacten
5	Bewoner is zelfstandig in het aangaan, onderhouden en afbreken van contacten; weet inhoud te geven aan deze contacten

12 WAARDE- EN NORMBESEF	De mate waarin de bewoner in staat is zelfstandig leefregels te hanteren
1	Bewoner is niet in staat zelfstandig leefregels herkenbaar te gebruiken
2	Bewoner is in staat een beperkt aantal leefregels binnen de woongroep te hanteren
3	Bewoner is in staat zich te houden aan gestelde leefregels binnen de woongroep; een privacybesef is niet aanwezig
4	Bewoner is zich bewust van de geldende leefregels, zowel binnen als buiten de woongroep; gedraagt er zich niet altijd naar; een privacybesef is beperkt aanwezig
5	Bewoner is zich bewust van de geldende leefregels, zowel binnen als buiten de woongroep; gedraagt er zich naar; verwoord de eigen behoefte aan privacy

13 DAGELIJKSE ACTIVITEITEN	De mate waarin de bewoner in staat is zelfstandig invulling te geven aan dagelijkse bezigheden binnen de woongroep
1	Bewoner is niet in staat zelfstandig een bijdrage te leveren aan het leefklimaat binnen de woongroep
2	Bewoner is onder begeleiding in staat zelfstandig een aantal eenvoudige activiteiten uit te voeren
3	Bewoner is in staat een aantal bezigheden zelfstandig binnen de woongroep uit te voeren; pakt deze alleen op indien de bewoner daartoe gestimuleerd wordt
4	Bewoner is in staat gedurende een bepaalde tijd zich zelfstandig te concentreren op de dagelijkse bezigheden binnen de woongroep; ontleent eigenwaarde aan deze activiteiten
5	Bewoner is in staat zelfstandig op gestructureerde wijze inhoud te geven aan de dagelijkse bezigheden binnen de woongroep; ontleent eigenwaarde aan het resultaat van zijn bijdrage daaraan

14 RECREATIEVE ACTIVITEITEN	De mate waarin de bewoner in staat is zelfstandig deel te nemen aan activiteiten buiten de woongroep
1	Bewoner is niet in staat zelfstandig invulling te geven aan zijn ontspanning buiten de woongroep; kan passief genieten van zaken die in de omgeving plaatsvinden
2	Bewoner is beperkt in staat zelfstandig deel te nemen aan of aanwezig te zijn bij ontspannende activiteiten buiten de woongroep; geniet veelal van de dingen die er plaatsvinden
3	Bewoner is onder begeleiding in staat zelfstandig deel te nemen aan recreatieve bezigheden buiten de woongroep; pakt deze activiteiten echter niet zelfstandig op
4	Bewoner is in staat vrijwel zelfstandig invulling te geven aan de eigen vrije tijdsbesteding buiten de woongroep; is afhankelijk van begeleiding
5	Bewoner is in staat zelfstandig invulling te geven aan de eigen vrijetijdsbesteding buiten de woongroep

15 LEERVERMOGEN	De mate waarin de bewoner in staat is om zelfstandig kennis en/of vaardigheden aan te leren dan wel het geleerde in stand te houden
1	Bewoner is niet in staat bestaande vaardigheden te onderhouden
2	Bewoner is door veelvuldig herhalen in staat bestaande vaardigheden te onderhouden
3	Bewoner is door herhalen in staat nieuwe eenvoudige vaardigheden aan te leren; aangeleerde vaardigheden dienen onderhouden te worden
4	Bewoner is in staat nieuwe eenvoudige vaardigheden aan te leren; er treedt nauwelijks verlies van bestaande vaardigheden op
5	Bewoner is in staat nieuwe complexe vaardigheden aan te leren; kent geen verlies van bestaande vaardigheden

16 SAMENVATTING	Tenslotte, geef aan welke omschrijving van zorgafhankelijkheid van toepassing is op de bewoner
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

DUTCH version of the CDS for use in institutions for the mentally handicapped, used in this study

1 ETEN EN DRINKEN	De mate waarin de bewoner in staat is zelfstandig te voldoen aan de behoefte aan eten en drinken
1	Bewoner is niet in staat eten en drinken zelfstandig tot zich te nemen
2	Bewoner is niet zelfstandig in staat tot het opscheppen en klaarmaken van eten en drinken; is in staat zelfstandig eten en drinken naar de mond te brengen
3	Bewoner is met toezicht in staat tot het zelfstandig opscheppen, klaarmaken en naar de mond brengen van eten en drinken; kan hoeveelheid moeilijk bepalen
4	Bewoner is in staat met beperkt toezicht zelfstandig te eten en te drinken
5	Bewoner is in staat zelfstandig te voldoen aan de bereiding en de behoefte aan eten en drinken

2 INCONTINENTIE	De mate waarin de bewoner het vermogen heeft de uitscheiding van urine en faeces willekeurig te beheersen
1	Bewoner is niet zelfstandig in staat de uitscheiding van urine en/of faeces op te houden; is volledig incontinent
2	Bewoner is niet zelfstandig in staat de uitscheiding van urine en/of faeces te regelen; zonder hulp en/of hulpmiddelen is spontane uitscheiding niet mogelijk
3	Bewoner is in staat, mits volgens vaste patronen gestuurd, vrijwel continent te zijn
4	Bewoner is in staat de uitscheiding vrijwel zelfstandig te regelen, doet dit soms op plaatsen die daar niet voor bestemd zijn
5	Bewoner is in staat de uitscheiding te regelen

3 LICHAAMSHOUDING	De mate waarin de bewoner in staat is bij een bepaalde activiteit een juiste houding aan te nemen
1	Bewoner is niet zelfstandig in staat zelfstandig van lichaamshouding te veranderen
2	Bewoner is beperkt in staat zelfstandig een gewenste lichaamshouding aan te nemen bij activiteiten
3	Bewoner is in staat een juiste lichaamshouding aan te nemen bij activiteiten, maar past dit onvoldoende zelfstandig toe
4	Bewoner heeft weinig beperkingen in het zelfstandig aannemen van de juiste lichaamshouding
5	Bewoner heeft geen beperkingen in het zelfstandig aannemen van de juiste lichaamshouding

4 MOBILITEIT	De mate waarin de bewoner fysiek in staat is zich zelfstandig kan voortbewegen
1	Bewoner is immobiel en niet in staat tot het zelfstandig gebruik van hulpmiddelen
2	Bewoner is beperkt in staat zich zelfstandig voort te bewegen; maakt veelal gebruik van hulpmiddelen
3	Bewoner is redelijk mobiel, eventueel met gebruik van hulpmiddelen
4	Bewoner is in staat zich vrijwel zelfstandig voort te bewegen
5	Bewoner is volledig in staat zich zelfstandig voort te bewegen

5 DAG-NACHTRITME	De aard van het slaap-waakpatroon (bio-ritme) van de bewoner
1	Bewoner is niet gevoelig voor het dag- en nachtritme
2	Bewoner is beperkt gevoelig voor het dag- en nachtritme
3	Bewoner is gevoelig voor het dag- en nachtritme, heeft veel begeleiding nodig
4	Bewoner is gevoelig voor het dag- en nachtritme, heeft weinig begeleiding nodig
5	Bewoner heeft een normaal dag- en nachtritme, zorgt zelfstandig voor voldoende rust

6 AAN- EN UITKLEDEN	De mate waarin de bewoner beschikt over vaardigheden om zich zelfstandig aan- en uit te kleden
1	Bewoner is niet in staat zich zelfstandig aan- en uit te kleden
2	Bewoner is beperkt in staat zich zelfstandig aan- en uit te kleden, is niet in staat de logische volgorde van handelingen uit te voeren
3	Bewoner is deels in staat zich zelfstandig aan- en uit te kleden, heeft toezicht en begeleiding nodig
4	Bewoner is in staat zich vrijwel zelfstandig aan- en uit te kleden, heeft begeleiding nodig bij fijnmotorische vaardigheden
5	Bewoner is in staat zich zelfstandig aan- en uit te kleden, beschikt over fijnmotorische vaardigheden

7 LICHAAMS-TEMPERATUUR	De mate waarin de bewoner in staat is zelfstandig de lichaamstemperatuur te beschermen tegen externe invloeden
1	Bewoner is niet in staat zelfstandig gevoelens van koude en warmte aan te geven
2	Bewoner is beperkt in staat zelfstandig gevoelens van koude en warmte aan te geven; is niet in staat zelfstandig gepaste maatregelen daartegen te nemen
3	Bewoner is in staat zelfstandig gevoelens van koude en warmte aan te geven; is beperkt in staat zelfstandig gepaste maatregelen daartegen te nemen
4	Bewoner is in staat zelfstandig gevoelens van koude en warmte aan tegeven; is in hoge mate in staat zelfstandig gepaste maatregelen daartegen te nemen
5	Bewoner is in staat volledig zelfstandig de lichaamstemperatuur tegen externe invloeden te beschermen

8 HYGIËNE	De mate waarin de bewoner in staat is zelfstandig zorg te dragen voor zijn/haar lichaamsverzorging
1	Bewoner is niet in staat zelfstandig een bijdrage te leveren aan de lichaamsverzorging, zoals wassen, tandenpoetsen, haren kammen, etc.
2	Bewoner is beperkt in staat zelfstandig een bijdrage te leveren aan de lichaamsverzorging; doet dit niet uit zichzelf
3	Bewoner is in staat zelfstandig een aantal handelingen rondom de lichaamsverzorging uit te voeren; toezicht en begeleiding is nodig
4	Bewoner is in staat zelfstandig de meeste handelingen rondom de lichaamsverzorging uit te voeren; enig toezicht en begeleiding is nodig
5	Bewoner is in staat volledig zelfstandig zorg te dragen voor de eigen lichaamsverzorging

9 VERMIJDEN VAN GEVAAR	De mate waarin de bewoner in staat is zelfstandig voor zijn/haar eigen veiligheid te zorgen
1	Bewoner is niet in staat zelfstandig gevaar te onderkennen en te vermijden
2	Bewoner is beperkt in staat zelfstandig gevaren in de omgeving te onderkennen en te vermijden, dan wel zich te beschermen tegen eigen of andermans agressie
3	Bewoner is in staat deels zelfstandig een aantal risicovolle situaties in de omgeving te onderkennen en te vermijden; heeft hulp nodig om zich te beschermen tegen agressie van anderen
4	Bewoner is in staat vrijwel zelfstandig gevaar in de omgeving te onderkennen en te vermijden, dan wel zich te beschermen tegen agressie van anderen
5	Bewoner is in staat zelfstandig zorg te dragen voor de eigen veiligheid

10 COMMUNICATIE	De mate waarin de bewoner in staat is te communiceren
1	Bewoner is niet in staat zich door middel van woorden te uiten; door lichaamstaal kan de bewoner zijn belevingen aan bekenden uiten
2	Bewoner is beperkt in staat zich door woord en/of gebaar te uiten; maakt gebruik van klanken om zijn beleving te uiten; begrijpt door intonaties de boodschap die anderen willen overbrengen
3	Bewoner is in staat middels woordjes en/of specifieke gebaren eigen bedoelingen te uiten; begrijpt korte eenvoudige woorden van anderen
4	Bewoner is in staat zich door woord- en zingebruik en/of gebaren te uiten; begrijpt eenvoudige taal en/of gebaren van anderen
5	Bewoner is in staat zich door taal en/of gebaar te uiten; is in staat belevingen met anderen te delen

11 CONTACT MET ANDEREN	De mate waarin de bewoner in staat is tot het aangaan, onderhouden en afbreken van sociaal contact
1	Bewoner is niet in staat zelfstandig contacten met anderen te leggen; reageert positief op prettige belevingen en/of negatief op onprettige belevingen
2	Bewoner is beperkt in staat zelfstandig contacten met anderen te leggen; reageert op voor de bewoner belangrijke personen
3	Bewoner is in staat tot het zelfstandig onderhouden van een beperkt aantal contacten met de bewoner belangrijke personen
4	Bewoner is vrijwel zelfstandig in het aangaan, onderhouden en afbreken van contacten; enigszins inhoud te geven aan deze contacten
5	Bewoner is zelfstandig in het aangaan, onderhouden en afbreken van contacten; weet inhoud te geven aan deze contacten

12 WAARDE- EN NORMBESEF	De mate waarin de bewoner in staat is zelfstandig leefregels te hanteren
1	Bewoner is niet in staat zelfstandig leefregels herkenbaar te gebruiken
2	Bewoner is in staat een beperkt aantal leefregels binnen de woongroep te hanteren
3	Bewoner is in staat zich te houden aan gestelde leefregels binnen de woongroep; een privacybesef is niet aanwezig
4	Bewoner is zich bewust van de geldende leefregels, zowel binnen als buiten de woongroep; gedraagt er zich niet altijd naar; een privacybesef is beperkt aanwezig
5	Bewoner is zich bewust van de geldende leefregels, zowel binnen als buiten de woongroep; gedraagt er zich naar; verwoordt de eigen behoefte aan privacy

13 DAGELIJKSE ACTIVITEITEN	De mate waarin de bewoner in staat is zelfstandig invulling te geven aan dagelijkse bezigheden binnen de woongroep
1	Bewoner is niet in staat zelfstandig een bijdrage te leveren aan het leefklimaat binnen de woongroep
2	Bewoner is onder begeleiding in staat zelfstandig een aantal eenvoudige activiteiten uit te voeren
3	Bewoner is in staat een aantal bezigheden zelfstandig binnen de woongroep uit te voeren; pakt deze alleen op indien de bewoner daartoe gestimuleerd wordt
4	Bewoner is in staat gedurende een bepaalde tijd zich zelfstandig te concentreren op de dagelijkse bezigheden binnen de woongroep; ontleent eigenwaarde aan deze activiteiten
5	Bewoner is in staat zelfstandig op gestructureerde wijze inhoud te geven aan de dagelijkse bezigheden binnen de woongroep; ontleent eigenwaarde aan het resultaat van zijn bijdrage daaraan

14 RECREATIEVE ACTIVITEITEN	De mate waarin de bewoner in staat is zelfstandig deel te nemen aan activiteiten buiten de woongroep
1	Bewoner is niet in staat zelfstandig invulling te geven aan zijn ontspanning buiten de woongroep; kan passief genieten van zaken die in de omgeving plaatsvinden
2	Bewoner is beperkt in staat zelfstandig deel te nemen aan of aanwezig te zijn bij ontspannende activiteiten buiten de woongroep; geniet veelal van de dingen die er plaatsvinden
3	Bewoner is onder begeleiding in staat zelfstandig deel te nemen aan recreatieve bezigheden buiten de woongroep; pakt deze activiteiten echter niet zelfstandig op
4	Bewoner is in staat vrijwel zelfstandig invulling te geven aan de eigen vrije tijdsbesteding buiten de woongroep; is afhankelijk van begeleiding
5	Bewoner is in staat zelfstandig invulling te geven aan de eigen vrijetijdsbesteding buiten de woongroep

15 LEERVERMOGEN	De mate waarin de bewoner in staat is om zelfstandig kennis en/of vaardigheden aan te leren dan wel het geleerde in stand te houden
1	Bewoner is niet in staat bestaande vaardigheden te onderhouden
2	Bewoner is door veelvuldig herhalen in staat bestaande vaardigheden te onderhouden
3	Bewoner is door herhalen in staat nieuwe eenvoudige vaardigheden aan te leren; aangeleerde vaardigheden dienen onderhouden te worden
4	Bewoner is in staat nieuwe eenvoudige vaardigheden aan te leren; er treedt nauwelijks verlies van bestaande vaardigheden op
5	Bewoner is in staat nieuwe complexe vaardigheden aan te leren; kent geen verlies van bestaande vaardigheden

16 SAMENVATTING	Tenslotte, geef aan welke omschrijving van zorgafhankelijkheid van toepassing is op de bewoner
1	Volledig zorgafhankelijk
2	In grote mate zorgafhankelijk
3	Gedeeltelijk zorgafhankelijk
4	Beperkt zorgafhankelijk
5	Vrijwel zelfstandig

Italian version of the CDS, used in this study

1 MANGIARE E BERE	Livello entro il quale il paziente é in grado di soddisfare da solo i propri bisogni di cibo e bevande
1	Il paziente non é in grado di assumere cibo e bevande senza assistenza
2	Il paziente non é in grado di preparare cibo e bevande senza assistenza, il paziente é capace di portare il cibo e le bevande alla propria bocca senza assistenza
3	Il pazienta é in grado di preparare e portare il cibo alla propria bocca con controllo, ha difficoltá nel determinare la quantitá
4	Il pazienta é in grado di mangiare e bere da solo ma sotto controllo
5	Il pazienta é in grado di prepararsi il cibo e soddisfare i propri bisogni di cibo e bevande senza assistenza

2 INCONTINENZA	Livello entro il quale il paziente é in grado di controllare l'eliminazione di urine e di feci volontariamente
1	Il paziente non é in grado di controllare l'eliminazione e/o feci: é completamente incontinente
2	Il paziente non é in grado di controllare la propria escrezione da solo
3	Il paziente é in grado di controllare l'escrezioni per la maggior parte del tempo, se é aiutato da strutture fisse
4	Il paziente é in grado di controllare l'escrezioni senza assistenza per la maggior parte del tempo, qualche volta utilizza luoghi inadeguati
5	Il paziente é in grado di controllare l'escrezioni senza assistenza

3 POSTURA	Livello entro il quale il paziente é in grado di assumere la posizione appropriata ad una attivitá specifica
1	Il paziente non é in grado di cambiare la propria senza assistenza
2	Il paziente é capace di assumere una posizione di attivitá senza assistenza solo fino a un certo livello
3	Il paziente é in grado di assumere un'adeguata posizione per le attivitá, ma non é capace di farlo di propria iniziativa
4	Il paziente ha alcuni limiti che impediscono ad assumere una posizione appropriata
5	Il paziente non ha limiti che impediscono ad assumere una posizione appropriata

4 MOBILITÀ	Livello entro il quale il paziente é in grado di muoversi senza assistenza
1	Il paziente è immobilizzato e non in grado di utilizzare ausili mecanici da
2	Il paziente è parzialmente in grado di muoversi senza assistenza, spesso usa ausili mecanici
3	Il paziente è abbastanza mobile, talvolta utilizza ausili meccanici
4	Il paziente è in grado di muoversi senza assistenza per la maggior parte del tempo
5	Il paziente è in grado di muoversi senza assistenza per tutto il tempo

5 MODELLO DI SONNO/VEGLIA	Livello entro il quale il paziente è capace di mantenere una appropriata ciclo sonno/veglia senza assistenza
1	Il paziente non rispetta il modello sonno/veglia
2	Il paziente rispetta parzialmente il modello sonno/veglia
3	Il paziente rispetta il modello sonno/veglia, ma ha bisogno di notevole aiuto
4	Il paziente rispetta il modello sonno/veglia e ha bisogno di un minimo aiuto
5	Il paziente conosce il modello normale di sonno/veglia, e riposa sufficiemente

6 VESTIRSI E SVESTIRSI	Livello entro il quale il paziente è capace di vestirsi e svestirsi senza assistenza
1	Il paziente non è in grado di vestirsi/ svestirsi senza assistenza
2	Il paziente è solo parzialmente in grado di vestirsi e svestirsi senza assistenza, ma non è capace di agire con una certa logica
3	Il paziente è in grado di vestirsi e svestirsi, ma sotto controllo e con assistenza
4	Il paziente è in grado di vestirsi e svestirsi quasi senza assistenza, ma ha bisogno di aiuto nei movimenti di precisione
5	Il paziente è in grado di vestirsi e svestirsi senza assistenza, ha il controllo sui movimenti di precisione

7 TEMPERATURA DEL CORPO	Livello entro il quate il paziente è in grado di proteggere la temperature del proprio corpo dalle influenze esterne senza assistenza
1	Il paziente non è in grado di distinguere le temperature fredde e calde da solo
2	Il paziente è parzialmente capace di distinguere le temperature senza assistenza da solo, ma non è in grado di agire in modo appropriato
3	Il paziente è in grado di distinguere le temperature fredde e calde ed è parzialmente in grado di agire in modo appropriato
4	Il paziente è capace di esprimente le senzazioni di freddo e caldo da solo ed è capace di agire in modo appropriato abbastanza efficacemente
5	Il paziente è in grado di proteggere la temperatura del corpo da influenze esterne senza assistenza

8 IGIENE	Livello entro il quala il paziente è in grado di assicurare la propria igiene personale senza assistenza
1	Il paziente non è in grado di assicurare la propria igiene personale, p.e. fare il bagno, lavarsi i denti, pettinarsi, ecc., senza assistenza
2	Il paziente è parzialmente in grado di contribuire alla propria igiene personale, ma non di propria iniziativa
3	Il paziente è capace di compiere varie azioni rispetto alla propria igiene personale senza assistenza, ma sotto controllo e con aiuto
4	Il paziente è capace di compiere molte azioni rispetto alla propria igiene personale, ma sono ancora richiesti controllo e aiuto
5	Il paziente è capace di prendersi cura dalla propria igiene personale senza assistenza

9 EVITARE I PERICOLI	Livello in cui il paziente è capace di mantenere la sicurezza a se stesso senza assistenza
1	Il paziente non è in grado di ricocoscere ad evitare i pericoli da solo
2	Il paziente è limitatamente in grado di ricocoscere ad evitare i pericoli nel proprio ambiente da solo, e/o a proteggere se stesso dall'aggressione di se o degli altri
3	Il paziente è parzialmente in grado di ricocoscere ed evitare alcune situazioni di pericolo proprio ambiente da solo, ma ha bisogno di aituto a proteggere se stesso dall'aggressione di altri
4	Il paziente è in grado di reconoscere ed evitare I pericoli praticamente da solo, e/o di proteggere se stesso dall'aggressione degli altri in molte occasioni
5	Il paziente è in grado di mantenere la propria sicurezza senza assistenza

10 COMMUNICAZIONE	Livello entro il quade il paziente è in grado di communicare senza assistenza
1	Il paziente non è in grado di communicare verbalmente, ma è capace di esprimersi in un modo non verbale con le persone da lui conosciute
2	Il paziente è limitatamente in grado di esprimersi verbalmente e non, utilizza suoni per esprimente le proprie esperienze, capisce ciò ce altri vogliono comunicare attraverso l'intonazione
3	Il paziente è capace di esprimere per mezzo di semplici parole e/o specifici gesti, capisce semplici brevi parole degli altri
4	Il paziente è in grado di esprimere con parole e frasi e/o specifici gesti, capisce un linguaggio semplice e/o gesti degli altri
5	Il paziente è in grado di esprimersi verbalmente e non, e condividere le proprie esperienze con gli altri

11 RAPPORTO CON GLI ALTRI	Livello entro il quale il paziente è in grado di instaurare, mantenere e porre termine a rapporti sociali
1	Il paziente da solo non è in grado di stabilire rapporti con gli altri, reagisce passivamente alle esperienze piacevoli e/o neativamente alle spiacevoli
2	Il paziente è limitatamente in grado di reagire alle persone importanti per lui/lei
3	Il paziente è capace di mantenere un limitato numeri di rapporti con le persone a lui/lei importanti
4	Il paziente può molto spesso instaurare, mantenere, porre fine a rapporti indipendentemente
5	Il paziente può instaurare e mantenere e porre fine a rapporti indipendentemente, ed è in grado di attribuuire un significato ad essi

12 SISTEMA DI REGOLE E VALORI	Livello entro il quale il paziente è in grado di osservare le regole da solo
1	Il paziente non è in grado di osservare le regole da solo
2	Il paziente è in grado di osservare un limitato numero di facili regole
3	Il paziente è in grado di seguire facili regole, ma il senso di privacy è assente
4	Il paziente conosce le regole, siano esse facili o non, non sempre si comporta corentemente con esse, a un limitato senso della privacy
5	Il paziente conosce le regole, si comporta coerentemente con esse, esprime il proprio bisogno di privacy

13 ATTIVITÀ QUOTIDIANE	Livello entro il quale il paziente è in grado di organizzare le semplici attività quotidiane senza assistenza
1	Il paziente non è in grado di effettuare semplici attività quotidiane da solo
2	Il paziente è in grado di effettuare semplici attività quotidiane con aiuto
3	Il paziente è in grado di compiere alcune attività semplici da solo, ma lo fa solo se stimolato
4	Il paziente è capace di concentrarsi su semplici attività quotidiane per poco tempo, da queste attività ottiene rispetto di se
5	Il paziente è capace di compiere da solo semplici attività quotidiane in una maniera strutturata ricava rispetto di se da risultato del proprio rendimento nelle attività

14 ATTIVITÀ RECREATIVE	Livello entro il quale il paziente è in grado di partecipare alle attività al di fuori di quelle semplici senza assistenza
1	Il paziente è in grado di partecipare ad attività recreative al di fuori di quelle semplici senza assistenza, è capace di apprezzare gli eventi che accadono nel proprio ambiente passivamente
2	Il paziente è solo fino a un certo livello in grado di partecipare o essere presente ad attività creative al di fuori di quelle semplici da solo, spesso apprezza le attività
3	Il paziente è in grado di partecipare o essere presente ad attività creative sotto controllo tuttavia nom partecipa di propria iniziativa
4	Il paziente è capace partecipare o essere presente ad attività creative quasi indipendentemente deve tuttavia essere controllato
5	Il paziente è in grado di partecipare o essere presente ad attività creative senza assistenza

15 ABILITÀ DI IMPARARE	Livello entro il quale il paziente è capace di acquisire conoscenze e/o abilità e/o conservare ciò che precedentemente ha imparato senza assistenza
1	Il paziente non è capace di mantenere le abilità esistenti
2	Il paziente è capace di mantenere le abilità esistenti attraverso ripetizioni frequenti
3	Il paziente è in grado di imparare nuove semplici abilità attraverso la ripetizione, le abilità imparate devono essere richiamate
4	Il paziente è in grado di imparare semplici nuove abilità, difficilmente dimentica le abilità acquisite
5	Il paziente è in grado di imparare nuove complesse attività, non dimentica quelle acquisite

16 FOGLIO RIASSUNTIVO	Indicare quale livello di dipendenza infermieristica attribuire al paziente
1	Il paziente è completamente dipendente
2	Il paziente ha un elevato grado di dipendenza
3	Il paziente è parzialmente dipendente
4	Il paziente ha un limitato livello di dipendenza
5	Il paziente è quasi indipendente

Norwegian version of the CDS, used in this study

1 SPISING OG DRIKKING	Pasientens evne til å tilfredsstille sitt behov for mat og drikke uten hjelp
1	Pasienten greier ikke å spise og drikke uten hjelp
2	Pasienten kan ikke lage mat og drikke uten hjelp; pasienten greier å putte mat og drikke i mummen ved egen hjelp
3	Pasienten greier å lage i stand og putte mat og drikke i munnen ved egen hjelp hvis hun/han får rettledning; har imidlertid vansker med å bestemme mengden
4	Pasienten er i stand til å spise og drikke uten hjelp, men med noe rettledning
5	Pasienten er i stand til å lage måltider og tilfredstille sine behov for mat og drikke uten hjelp

2 INKONTINENS	Pasientens grad av kontroll med urin og avføring
1	Pasienten er ikke i stand til å hindre utslipp av urin og/eller avføring; er fullstendig inkontinent
2	Pasienten er ikke i stand til å kontrollere urin og/eller avføring; spontant utslipp av avføring er umulig uten assistanse
3	Pasienten er i stand til å være kontinent det meste av tiden, hvis rettledet av faste rutiner
4	Pasienten er i stand til å kontrollere avføring uten hjelp det meste av tiden, bruker noen ganger upassende steder
5	Pasienten er i stand til å kontrollere avføring uten hjelp

3 KROPPSSTILLING	Pasientens grad av evne til å innta en hensiktsmessig kroppsstilling for den aktiviteten som skal utføres
1	Pasienten er ikke i stand til å endre sin kroppsstilling uten hjelp
2	Pasienten greier til en viss grad å endre sin kroppsstilling for aktivitet uten hjelp
3	Pasienten er i stand til å innta en hensiktsmessig kroppsstilling for ulike aktiviteter, men greier det ikke i tilstrekkelig grad på eget initiativ
4	Pasienten har få begrensninger m.h.t. å innta en hensiktsmessig kroppsstilling
5	Pasienten har ingen begrensninger m.h.t. å innta en hensiktsmessig kroppsstilling

4 BEVEGELIGHET	Patientens grad av evne til å forflytte seg uten hjelp
1	Pasienten er immobil og ikke i stand til å bruke tekniske hjelpemidler på egen hånd (stokk, gåstol, rullestol, etc.)
2	Pasienten er til en viss grad istand til å forflytte seg uten hjelp; bruke ofte tekniske hjelpemidler
3	Pasienten er ganske mobil; bruker noen ganger tekniske hjelpemidler
4	Pasienten forflytter seg uten hjelp mesteparten av tiden
5	Pasienten forflytter seg uten hjelp hele tiden

5 DØGNRYTME	Pasientens grad av evne til å holde tilfredstillende døgnrytme uten hjelp
1	Pasienten registrerer ikke normal døgnrytme
2	Pasienten registrerer ikke helt normal døgnrytme
3	Pasienten folger normal døgnrytme, men trenger mye hjelp
4	Pasienten folger normal døgnrytme og trenger lite hjelp
5	Pasienten kjenner normal døgnrytme og sørger på egen hånd for nok søvn/hvile

6 AV- OG PÅKLEDNING	Pasientens grad av evne til å kle av og på seg uten hjelp
1	Pasienten er ikke i stand til å kle av og på seg uten hjelp
2	Pasienten er til en viss grad i stand til å kle av og på seg uten hjelp, men er ikke i stand til å gjøre dette i logisk rekkefølge
3	Pasienten er delvis i stand til å kle av og på seg, men rettledning og hjelp trengs
4	Pasienten kler av og på seg nesten uten hjelp, men trenger hjelp med finmotorikken (kneppe knapper o.l.)
5	Pasienten kler av og på seg uten hjelp; har kontroll over finmotorikken

7 KROPPS-TEMPERATUR	Pasientens grad av evne til å beskytte seg mot ytre temperatursvingninger
1	Pasienten er ikke i stand til på egen hånd å skjelne mellom kulde og varme
2	Pasienten er til en viss grad i stand til på egen hånd å kjenne temperatursvingninger, men greier ikke å ta de nødvendige forholdsregler
3	Pasienten er i stand til å kjenne kulde og varme på egen hånd; kan til en viss grad ta de rette forholdsregler
4	Pasienten kjenner på egen hånd kulde og varme; tar i stor grad de rette
5	Pasienten er i stand til å beskytte kroppen mot temperatursvingninger uten hjelp

8 HYGIENE	Pasientens grad av evne til å ivareta sin personlige hygiene uten hjelp
1	Pasienten er ikke istand til å i vareta sin personlige hygiene, som bading, børste hår/tenner osv. uten hjelp
2	Pasienten bidrar noe med å stelle seg selv, men gjør ikke dette på eget initiativ
3	Pasienten kan gjøre en god del av sitt personlige stell uten hjelp, men rettledning og hjelp trengs
4	Pasienten kan gjøre mesteparten av sitt personlige stell uten hjelp, men noe rettlidning og hjelp trengs likevel
5	Pasienten er i stand til å seg av sin personlige hygiene uten hjelp

9 Å UNNGÅ FARE	Pasientens grad av evne til å ivareta sin egen sikkerhet uten hjelp
1	Pasienten er ikke i stand til å registrere og unngå fare på egen hånd
2	Pasienten er til en viss grad i stand til å registrere og unngå fare i sitt eget
3	Pasienten er delvis i stand til på egen hånd å registrere og unngå mange farlige i situasjoner i sitt miljø, men trenger hjelp til å beskytte seg mot aggresjon fra andre
4	Pasienten er i stand til å registrere og unngå fare i sitt miljø nesten helt på egen hånd og/eller beskytte seg mot aggresjon fra andre mesteparten av tiden
5	Pasienten er i stand til å ivareta sin egen sikkerhet uten hjelp'

10 KOMMUNIKASJON	Pasientens grad av kommunikasjonsevne
1	Pasienten er ikke i stand til å uttrykke seg verbalt, men er i stand til å formidle sine opplevelser ikke-verbalt til personer som er kjente for ham/henne
2	Pasienten er til en viss grad i stand til å uttrykke seg verbalt og ikke-verbalt; bruker lyder for å uttrykke sine opplevelser; forstår hva andre ønsker å kommunisere gjennom stemmeleie og stemmebruk
3	Pasienten er i stand til å uttrykke seg ved hjelp av enkle ord og/eller spesifikke gester; forstår enkle korte ord fra andre
4	Pasienten er i stand til å uttrykke seg i ord og setninger og/eller spesifikke gester; forstår enkelt språk og/eller gester fra andre
5	Pasienten er i stand til å uttrykke seg verbalt og ikke-verbalt; er i stand til å dele opplevelser med andre

11 KONTAKT MED ANDRE	Pasientens grad av evne til å få og opprettholde sosial kontakt
1	Pasienten er ikke i stand til på egen hånd å få kontakt med andre; reagerer positivt på hyggelige opplevelser og negativt på utrivelige opplevelser
2	Pasienter er noe i stand til å få kontakt med andre på egen hånd; reager på personer som er viktige for ham/henne
3	Pasienter er i stand til å opprettholde kontakt på egen hånd met et begrenset antall som er viktige for ham/henne
4	Pasienter kan uten hjelp oppnå sosial kontakt og opprettholde den mesteparten av tida; er i stand til å legge en viss betydning i disse kontaktene
5	Pasienter kan på egen hånd oppnå, opprettholde og avslutte sosiale kontakt, er i stand til å legge noe avbetydning i disse kontaktene

12 SANS FOR REGLER OG VERDIER	Pasientens grad av evne til på egen hånd å merke seg regler
1	Pasienter er ikke i stand til å merke seg legler
2	Pasienten er i stand til å merke seg et begrenset antall regler innenfor institusjonen
3	Pasienten er i stand til å følge regler innenfor institusjonene, men sansen for privathet er fraværende
4	Pasienten er klar over regler både i og utenfor institusjonen; oppfører seg ikke alltid i samsvar med dem; har en begrenset sans for privathet
5	Pasienten er klar over regler, både i og utenfor institusjonen; oppfører seg deretter; uttrykker sitt behov for privatlivets fred

13 DAGLIGE AKTIVITETER	Pasientens grad av evne til uten hjelp å strukturere daglige aktiviteter innenfor institusjonen
1	Pasienten er ikke stand til å utføre daglige aktiviteter innenfor institusjonen på egen hånd
2	Pasienten er i stand til å utføre enkle aktiviteter innenfor institusjonen på egen hånd
3	Pasienten er i stand til å utføre mange aktiviteter innenfor institusjonen på egen hånd, men gjør dette kun på oppfordring
4	Pasienten er i stand til å konsentrere seg om daglige aktiviteter innenfor institusjonen for en stund på egen hånd; får selvrespekt av dette
5	Pasienten er i stand til på egen hånd å utføre daglige aktiviteter innenfor institusjonen på en strukturert måte; får selvrespekt av resultatet

14 FRITIDSSYSLER	Pasientens grad av evne til å delta i aktiviteter utenfor institusjonen uten egen hjelp
1	Pasienten er ikke i stand til å delta i fritidssysler utenfor institusjonen uten hjelp; er i stand til å glede seg over det som skjer, selv om han/hun ikke er aktivt med
2	Pasienten er til en viss grad i stand til å delta i eller være til stede på fritidssysler utenfor institusjonen på egen hånd; gleder seg ofte over aktivitetene
3	Pasienten er i stand til å delta i fritidssysler på egen hånd uten rettledning; men engasjerer seg ikke i slike aktiviteter på eget initiativ
4	Pasienten er i stand til nesten helt på egen hånd å delta i fritidssysler, men er avhengig av rettledning
5	Pasienten er i stand til uten hjelp å utføre sine fritidssysler utenfor institusjonen

15 LÆREEVNE	Pasientens grad av evne til uten hjelp å ta i mot ny kunnskap og/eller ferdigheter og/eller vedlikeholde det som tidligere er lært
1	Pasienten er ikke i stand til å vedlikeholde tidligere ferdigheter
2	Pasienten er i stand til å vedlikeholde tidligere ferdigheter ved hjelp av hyppig repetisjon
3	Pasienten er i stand til å lære enkle, nye ferdigheter ved hjelp av repetisjon; innlærte ferdigheter trenger vedlikeholde
4	Pasienten er i stand til å lære enkle, nye ferdigheter; det er nesten ikke noe tap av tidligere innlærte ferdigheter
5	Pasienten er i stand til å lære komplekse nye ferdigheter; det er ikke noe tap av tidligere innlærte ferdigheter

16 OPPSUMMERING	Til slutt, sett ring rundt den tallverdien du mener best beskiver hvor avhengig pasienten er av hjelp til pleie, for å få dekket sine grunnleggende behov
1	Pasienten er fullstendig avhengig av hjelp til pleie
2	Pasienten er i stor grad avhengig av hjelp til pleie
3	Pasienten er delvis avhengig av hjelp til pleie
4	Pasienten er bare i begrenset grad avhengig av hjelp til pleie
5	Pasienten er så å si uavhengig av hjelp til pleie

US-English version of the CDS, used in this study

1 EATING AND DRINKING	The extent to which the resident is able to satisfy his/her need for food and drink unaided
1	Resident is unable to take food and drink unaided
2	Resident is unable to prepare food and drink unaided; resident is able to put food and drink into his/her mouth unaided
3	Resident is able to prepare and put food and drink into his/her mouth unaided with supervision; has difficulty determining quantity
4	Resident is able to eat and drink unaided with some supervision
5	Resident is able to prepare meals and to satisfy his/her need for food and drink unaided

2 INCONTINENCE	The extent to which the resident is able to control the discharge of urine and faeces voluntarily
1	Resident is unable to prevent the discharge of urine and/or faeces; is completely incontinent
2	Resident is unable to control the discharge of urine and/or faeces; spontaneous discharge of excretions is impossible without assistance
3	Resident is able to be continent most of the time, if guided by fixed patterns
4	Resident is able to control excretions unaided most of the time; sometimes uses unsuitable places
5	Resident is able to control excretions unaided

3 BODY POSTURE	The extent to which the resident is able to adopt a position appropriate to a certain activity
1	Resident is unable to change his/her body posture unaided
2	Resident is to some extent able to adopt a position for activities unaided
3	Resident is able to adopt an appropriate position for activities, but fails to do so sufficiently on his/her own initiative
4	Resident has few limitations as to adopting the appropriate position
5	Resident has no limitations as to adopting the appropriate position

4 MOBILITY	The extent to which the resident is able to move about unaided
1	Resident is immobile and unable to use mechanical aids by him/herself
2	Resident is to some extent able to move unaided; often uses mechanical aids
3	Resident is fairly mobile, sometimes uses mechanical aids
4	Residents is able to move unaided most of the time
5	Residents is able to move unaided all of the time

5 DAY/NIGHT PATTERN	The extent to which the resident can maintain an appropriate day/night cycle unaided
1	Resident is insensitive to day/night pattern
2	Resident is somewhat insensitive to day/night pattern
3	Resident is sensitive to day/night pattern, but needs much help
4	Resident is sensitive to day/night pattern, and needs little help
5	Resident knows normal day/night pattern, and secures enough rest for him/herself

6 GETTING DRESSED AND UNDRESSED	The extent to which the resident is able to get dressed and undressed unaided
1	Resident is unable to get dressed and undressed unaided
2	Resident is to some extent able to get dressed an undressed unaided, but is unable to perform actions in a logical order
3	Resident is partly able to get dressed an undressed unaided, but supervision and aid are required
4	Resident is able to get dressed and undressed almost unaided, but needs help with fine motor skills
5	Resident is able to get dressed and undressed unaided, has control over fine motor movements

7 BODY TEMPERATURE	The extent to which the resident is able to protect his/her body temperature against external influences unaided
1	Resident is unable to distinguish cold and warm temperatures by him/herself
2	Resident is to some extent able to distinguish cold and warm temperatures by him/herself; but is unable to take appropriate action
3	Resident is able to distinguish cold and warm temperatures by him/herself; is to some extent able to take appropriate action
4	Resident is able to indicate feelings of cold and warm by him/herself; is to a great extent able to take appropriate action
5	Resident is able to protect body temperature against external influences unaided

8 HYGIENE	The extent to which the resident is able to take care of his/her personal hygiene unaided
1	Resident is unable to assure his/her personal hygiene, e.g., bathing, brushing his/her teeth, combing his/her hair, etc., unaided
2	Resident is somewhat able to contribute to his/her personal hygiene, but does not do so on his/her own initiative
3	Resident is able to perform several actions regarding his/her personal hygiene unaided, but supervision and aid are required
4	Resident is able to perform most actions regarding his/her personal hygiene unaided, but some supervision and aid are still required
5	Resident is able to take care of his/her personal hygiene completely unaided

9 AVOIDANCE OF DANGER	The extent to which the resident is able to assure his/her own safety unaided
1	Resident is unable to recognize and avoid danger by him/herself
2	Resident is somewhat able to recognize and avoid dangers in his/her environment by him/herself, and/or to protect him/herself against his/her own aggression or aggression from others
3	Resident is partly able to recognize and avoid several dangerous situations in his/her by him/herself, but needs help to protect him/herself against aggression from others
4	Resident is able to recognize and avoid dangers in his/her environment practically by him/herself, and/or to protect him/herself against aggression from others most of the time
5	Resident is able to take care of his/her own safety unaided

10 COMMUNICATION	The extent to which the resident is able to communicate
1	Resident is unable to express him/herself verbally, but is able to communicate his/her experiences to persons known to him/her nonverbally
2	Resident is somewhat able to express him/herself verbally and nonverbally; uses sounds to express his/her experiences; understands what others want to communicate through intonation
3	Resident is able to express him/herself by means of simple words and/or specific gestures; understands simple short words from others
4	Resident is able to express him/herself in words and sentences and/or specific gestures; understands simple language and/or gestures from others
5	Resident is able to express him/herself verbally and nonverbally; is able to share experiences with others

11 CONTACT WITH OTHERS	The extent to which the resident is able to appropriately make, maintain and end social contacts
1	Resident is unable to make contact with others by him/herself; reacts positively to pleasant experiences and/or negatively to unpleasant experiences
2	Resident is somewhat able to make contact with others by him/herself; reacts to persons important to him/her
3	Resident is able to maintain a limited number of contacts with persons important to him/her by him/herself
4	Resident can make, maintain and end contacts independently most of the time; is able to givesome meaning to these contacts
5	Resident can make, maintain and end contacts independently; is able to give meaning to these contacts

12 SENSE OF RULES AND VALUES	The extent to which the resident is able to observe rules by him/herself
1	Resident is unable to observe rules
2	Resident is able to observe a limited number of rules within the facility
3	Resident is able to follow rules within the facility, but sense of privacy is absent
4	Resident is aware of rules, both within and outside the facility; does not always behave accordingly; has a limited sense of privacy
5	Resident is aware of rules, both within and outside the facility; behaves accordingly; expresses his/her own need for privacy

13 DAILY ACTIVITIES	The extent to which the resident is able to structure daily activities within the facility unaided
1	Resident is unable to carry out daily activities within the facility by him/herself
2	Resident is able to carry out simple activities within the facility with aid
3	Resident is able to carry out several activities within the facility by him/herself, but does so only when stimulated
4	Resident is able to concentrate on daily activities within the facility by him/herself for a while; derives self-respect from these activities
5	Resident is able to perform daily activities within the facility in a structured way by him/herself; derives self-respect from the result of his/her performance of the activities

14 RECREATIONAL ACTIVITIES	The extent to which the resident is able to participate in activities outside the facility unaided
1	Resident is unable to participate in recreational activities outside the facility unaided; is able to enjoy things happening in his/her environment passively
2	Resident is to some extent able to participate in or be present at recreational activities outside the facility by him/herself; often enjoys activities
3	Resident is able to participate in recreational activities outside the facility by him/herself with supervision; however does not engage in these activities on his/her own initiative
4	Resident is able to perform recreational activities outside the facility almost independently however is dependent on supervision
5	Resident is able to perform his/her own recreational activities outside the facility unaided

15 LEARNING ABILITY	The extent to which the resident is able to acquire knowledge and/or skills and/or to retain that which was previously learned unaided
1	Resident is unable to retain existing skills
2	Resident is able to retain existing skills through frequent repetition
3	Resident is able to learn simple new skills through repetition; learned skills need to be kept up
4	Resident is able to learn simple new skills; there is hardly any loss of existing skills
5	Resident is able to learn complex new skills; there is no loss of existing skills

16 SUMMARY SHEET	Finally, indicate which definition of nursing-care dependency applies to the resident
1	Resident is completely dependent on nursing care
2	Resident is to a great extent dependent on nursing care
3	Resident is partially dependent on nursing care
4	Resident is only to a limited extent dependent on nursing care
5	Resident is almost independent on nursing care